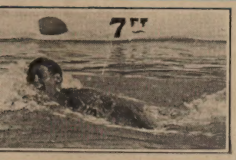
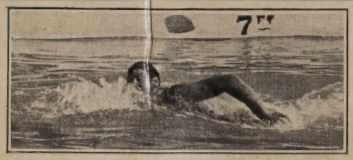
SWIMMING THE AMERICAN CRAWL

WEISSMULLER

SWIMMING THE AMERICAN CRAWL

By

JOHNNY WEISSMULLER

The world's fastest swimmer tells just how he gets his wonderful speed and ease of motion.

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SWIMMING THE AMERICAN CRAWL

AMONG MY SOUVENIRS

SWIMMING THE AMERICAN CRAWL

BY
JOHNNY WEISSMULLER

IN COLLABORATION WITH
CLARENCE A. BUSH

With Illustrations

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1930

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TO

WILLIAM BACHRACH

MY COACH

AND TO THE MEMBERS

OF

THE ILLINOIS ATHLETIC CLUB

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INTRODUCTION

How does he do it? For eight years the swimming world has been asking this question about Johnny Weissmuller. Seeing him perform was not enough. The hand is quicker than the eye, as the magician says, and so are the feet when a swimmer is sprinting for world's records. Speed swimming is an elusive art, and added to this is the obscuring veil drawn across what is being done below the surface by the churning and glinting waters. Even when you see what the swimmer does, you don't know why he does it.

Now for the first time, John Weissmuller, in this book, tells just how he does it and why, how others do it and why their methods are less effective than his own, and how the beginner as well as the advanced student can learn to do it his way. He has not told before because the information is valuable, and as an amateur he could not take his just compensation for it. At the close of 1928, after his return from trips to

the Olympic Games in Amsterdam, and to Japan as a guest of the Crown Prince, he announced his retirement from amateur fields, and 'now it can be told.'

As Johnny's collaborator in the preparation of this book, I want to put in a word of explanation. This is Weissmuller's own story, dictated by him, told in the first person. Naturally the first person pronouns, 'I' and 'My,' pop up frequently. This, I believe, is just the way you want it, and just the way you should have it. You have had plenty of stuff at second-hand; now you want it at first-hand, just as though Johnny were talking to you face to face, informally. Some passages may look egotistical. If he were speaking to you, as he did to me, they would not appear so. Some persons are so constituted that every 'I' and 'Me' appearing in type irritates them the way waving a red flag arouses a bull. 'He's conceited, he's a boaster,' they say with a snort.

Johnny worried about this, constantly demanding that this and that passage be toned down to remove the impression of vanity which the printed page might convey to some. Most

of these requests I have opposed on the ground that they would take some of the color and life out of the text.

So if at any time you think that Johnny, in the phraseology he is using, is getting too stuck up, blame it not upon Johnny, but on me. For nothing could be more foreign to the nature of John Weissmuller. He is the same bashful, unassuming boy he was when I first met him before he set the whole swimming world upside down. You would realize the truth of this assertion if you could meet him, shake his hand, and talk with him. I hope you will some day.

Swimming the American crawl stroke did not begin with Weissmuller. He fell heir to a vast store of information — and misinformation — so it is not to be claimed that everything he does is original with him. He tried out all methods for his own use, rejecting some ideas and adopting others. His contribution to swimming knowledge is his perfection of the crawl stroke, by which he achieved his position as the greatest swimmer the world has ever developed.

Naturally, he owes much of his knowledge and all of his training to his coach, William

Bachrach, who produced many great swimmers before Johnny's day, and will without doubt produce more. What Bachrach said to Weissmuller, and what Johnny heard Bachrach say to others, may ring like a refrain through the chapters which follow; but that is only to be expected of a protégé who has followed his teacher's precepts to the letter.

As collaborator with John Weissmuller, I take great pride in presenting herewith 'his own story.'

CLARENCE A. BUSH

SWIMMING THE AMERICAN CRAWL

SWIMMING
THE AMERICAN CRAWL

CHAPTER I

WHEN A MARK WAS MADE

AROUND the great Fleishacker Pool in San Francisco a throng was assembled and it was rumbling with excited expectation. I found my lane, kicked off my bath sandals and dropped my bathrobe behind me. My rivals, two on each side, were likewise getting cleared for action. It was a colorful scene, with the crowd astir in the bright sunshine and the blue water in the pool divided into lanes by ropes buoyed with cork.

'The start will be "ready" and a fast gun,' said the starter, gun in hand. He was a veteran, so he spoke calmly, although loud enough for all the contestants to hear above the noise. He was deliberate and as motionless as humanly possible, flickering not even an eyelash that

might pull some nervous competitor off his mark too soon.

We stepped to the edge of the pool, each taking a characteristic position, coiled ready for the spring that would send us splashing for the hundred-meter straightaway free-style championship of the United States. A world's record was expected.

One man, leaning a bit too far, lost his balance and flopped into the pool. The rest of us relaxed, stepped away from our marks, and looked around at the crowd, at each other — anything to break the tension on our throbbing arteries.

I do not often make a false start. That is not because I have no anxiety, for I never went into a championship race without recognizing that there was a chance of being beaten. Although I am always as anxious as the rest to get away fast, sharply with the crack of the gun, I have learned a technique that steels me against making a premature plunge. And the strain of having others 'break' and delay the race does not affect me. The reason for this attitude will be explained as I go along.

Again we took our marks, and this time as we all held steady the starter did not wait so long.

'Ready!' he shouted, and we leaned forward and coiled a bit tighter.

'Bang!' cracked the quick gun, and we were off, almost simultaneously. It was a good start, and we were not called back by repeated shots from the starter's gun, as often happens when there is a large field of contestants. I shall explain my starting plunge later. It is different in several important particulars from the plunge used by other swimmers.

I swim straight down my lane. To swerve to the right or left would lengthen the distance I have to go, and it would take energy to correct my course. It would also bring me in contact with the cork-floated rope which marks each side of my lane. This appears so self-evident as hardly to need mentioning, but many swimmers of the first rank do not appreciate its importance enough to give it the attention to master it.

On *every stroke* I turn my face to the side to inhale. Here is a point of technique to remember. I shall go into it in detail, later in this

book, as it is important for several reasons. I will explain one reason now because it had a bearing on this particular race. When I turn my face to the side, I glance at the rope, or ahead at the mark on the end of the pool toward which I am swimming.

Some swimmers, accustomed to indoor pools, get the habit of guiding themselves by the black lines painted on the bottom of the tank to mark the lanes. When they get into the open water outdoors, where the lanes are not marked on the bottom, but sometimes by ropes on the surface, and at other times not at all, they are lost and take a zigzag course.

Usually as I swim I pay no attention to my rivals. I swim my own race. I concentrate on perfect form, getting the utmost efficiency out of every stroke, swimming the best I know how. In most competitive sports what the other fellow does has a physical effect on your performance. In swimming it can have only a psychological effect. If you get to worrying about what your *rival* is doing, you get your mind off what *you* are doing, and you fail to concentrate on perfect form.

UNDER FULL STEAM WITH MY CRAWL STROKE

Only twice in my career of eight years in national and international competition have I violated this rule of ignoring my rivals in a race, and both times I came near being beaten.

This hundred-meter contest for the national championship was one of those races. I am telling about it because it offers more chance for dramatization, and a chance to bring home rules of strategy that did not apply to most of my races.

On this particular occasion my chief rival was George Kojac, of the New York Boys' Club. Kojac had been coming along at a great pace, improving month by month, breaking world's records at both the crawl and backstroke; mostly at the backstroke.

I had no more than the usual precautionary fear that he would outswim me this time, but I had noticed he appeared keyed up more than usual before the race started. There was something in his eye and attitude that arrested my attention. So from some vagary of fancy I had so far forgotten myself that I was watching him instead of concentrating on my stroke. He was in the next lane to my left, and I could see him

every time I turned my face to the side to inhale — see him without in any way changing the position of my body or altering my stroke.

Kojac was working like a demon, thrashing with might and main, fighting every inch of the way. He kept even with me, and then he crept a little ahead. You may call it vanity or over-confidence, or what you will, but this gave me no unusual concern at first. Then he crept a little farther ahead. I judged he was about two feet in the lead, though it is hard to tell when you are in the water.

If I had been swimming my own race as usual, I would have been glancing ahead at the end of the pool, knowing on every stroke just how far I had yet to go. But I allowed Kojac to distract my attention and I did not appreciate how closely we were approaching the finish.

When at last I took a look ahead, my heart jumped out of my throat. We were hardly ten meters from the finish, and Kojac was two feet in the lead. With all the power I had in my system I fairly climbed out of the water, as I was told later, and thrashed those last ten meters just in time to touch the wall the flicker of a finger ahead of Kojac.

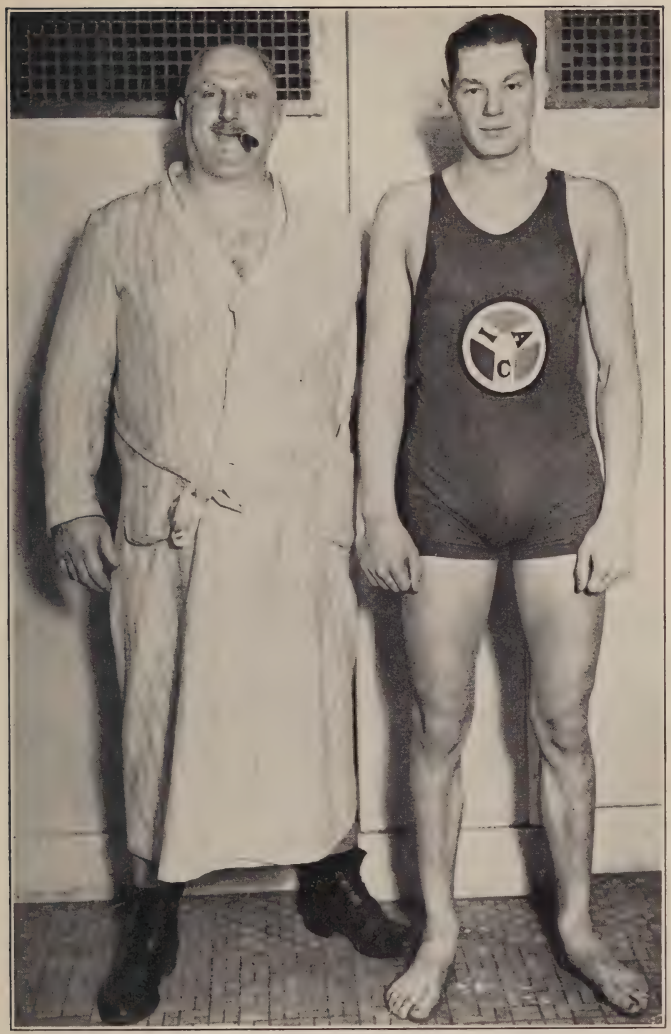
It was a great race. Although Kojac had lost the decision, he had himself broken the world's record. That's how close he was. Of course, finishing first, I got credit for the new world's record. The old mark was fifty-eight seconds. My new mark, which has since been accepted by the International Swimming Federation, was fifty-seven and four fifths seconds.

CHAPTER II

WHAT I HAD TO HAVE

BEFORE going into the detail of my methods, I think I should describe my physical equipment for swimming in general and for the crawl stroke in particular. Coach Bachrach says I am ideally endowed for crawl sprinting. When he first saw me, I weighed one hundred and sixty pounds, measured six feet two inches, was tall and lean, but not bony. When I first tried out with Bachrach, I was taller than most of the leading swimmers up to that time.

Nowadays I vary between one hundred and eighty-five and one hundred and ninety pounds, and I am six feet three inches in height. The old-timers, as a rule, were big-chested, beefy individuals, who got there by steamboat methods. Coach Bachrach, probably from observing the superior speed of the long, slim fishes like the sandpike and the pickerel, was looking for a snaky swimmer. You may notice that most of his champions, both men and women, since my



MY COACH AND I

initiation have been 'snakes.' Robert Skelton, John Faricy, Sybil Bauer, Ethel Lackie, and Paul Samson are outstanding examples. Arne Borg, of Sweden, was ten parts 'snake' and ninety parts 'steamboat.'

Now the long, snaky individual is best fitted to develop the leverage needed in sprint swimming, and at the same time get the relaxation which keeps the blood flowing freely through the arteries. He encounters less resistance in slipping through the water than does the squarely built husky. And from his very length he gets a streaming propulsion along the snaky undulations of his legs and feet.

My head is average in size, still taking a Number 7 hat, and my chin is not of the protruding type, so I get very little resistance on my face. My shoulders are broad enough to extend my reach and aid my leverage, and yet rounded and padded enough so that they minimize water resistance. My chest is large for good lung capacity, but it is fairly broad and fairly flat. By that I don't mean I have a hollow chest, for I have a full chest. I narrow down at the waist and have narrow hips. My legs

taper off to my feet. My arms likewise are long.

My hands and feet are large, perhaps unusually so, with long fingers and long toes. They are not so large as to be conspicuous, but large enough for good paddling capacity, like the blades of oars. My shoes are Number 10½ B and my gloves are Number 9.

Unlike the muscles of all other athletes, the swimmer's muscles are long, soft, and pliable. The average athlete's muscles are short, hard, and snappy, for quick and powerful alternation of contraction and flexion. The jumper, the runner, the boxer, the wrestler get their effectiveness from sudden and intense contraction. This contraction temporarily shuts off the flow of blood to the muscles.

Because the swimmer works in a different element, needing a constant and even flow of power, he has no use for sudden energetic contraction. Water is a solid, although a yielding substance. Motions to be effective in the water must be slow. As I have heard Bachrach point out on countless occasions, it even takes time for a stone to sink in water. Strenuous action in the water is not only ineffective, but the effort

toward such action is exceedingly tiring and you are frustrated.

I have heard of many great all-around athletes, but I never heard of an all-around athlete who was also good in the water. None of the great swimmers I ever heard of have excelled at other sports. This I think is due to the fact that a swimmer requires this totally different kind of physical equipment.

Swimmers at our club often see good athletes come down from the gymnasium, where they have exhibited strength and endurance and good wind, and jump into the pool and swim one or two lengths and stop, breathless and exhausted. They cannot understand why the water should tire them out so quickly. One reason is that they have not learned breath control, which I will explain later. The other reason is that they have been practicing contraction instead of relaxation; they try sudden and jerky movements and build up resistance, and they shut off the continuous and free flow of blood to the muscles.

So the swimmer must have long, soft, and pliable muscles. Here is another factor that gives the long individual an advantage in the

water. Having a longer frame, he develops longer muscles. The swimmer should not have big bones, and especially should not have big joints. His frame preferably is made of small bones well padded with flesh, and he has curves instead of angles. Bones are heavy like stones, while flesh is buoyant. Flesh produces curves and stream lines. This explains why the average woman is a better swimmer than the average man. The ladies are buoyant because they have small bones, much flesh, and many curves.

In addition to all these attributes, the swimmer must have a strong heart of large capacity to keep the blood pumping through his system in great volume. Doctors examining Arne Borg said he had an exceptionally large heart, one saying he had the 'heart of a horse.' He needs it the way he swims, as I shall explain later; but every speed swimmer needs a large heart. Every great swimmer, it should go without saying, has a heart more powerful and of greater capacity than that of the average person.

These are some of the natural gifts that a swimmer needs in order to break world's records — that is, apart from mastery of good

form. I had these things and other leading swimmers have them. I was able to beat them and the times of all who had gone before me because, to these physical advantages, my coach added what he conceived to be the perfect stroke.

When 'Bach' took me in charge, I was only sixteen years old, and I was not 'set in my ways.' I was like a shapeless piece of clay, you might say, ready to be moulded easily along the lines of perfect style as the coach had evolved it in his own mind.

CHAPTER III

HOW I DID IT

HERE is the stroke that I mastered with the careful guidance of Bachrach.

Starting flat on the water, face down, arms extended in front and legs extended to the rear, just as I obtain the maximum distance from my plunge, my right arm starts its downward pull. This pull is down, not outward like an oar, as the outward movement would throw all the burden of leverage on the shoulder muscles at an angle at which good power could not be applied. The arm is bent at the elbow, reducing the leverage and dividing the power burden between the shoulder and the elbow. As my right arm nears my hip, it relaxes.

During this time my left arm remains extended in front of me, skimming the surface of the water. An instant before the right arm loosens its hold upon leverage at the hip, my left arm starts down. My right arm is brought clear of the water with elbow bent. As it leaves the water, the muscles are completely relaxed

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 10

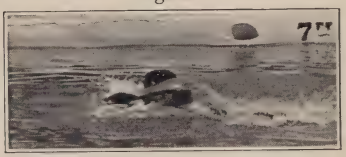


Fig. 11

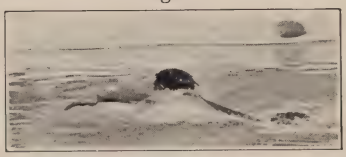


Fig. 12

TWELVE MOVIE SHOTS OF THE AMERICAN CRAWL

and kept relaxed throughout the recovery movement above water.

This bending of the elbow is vitally important to relaxation, and it must be done just so. Many swimmers think they are bending the elbow, but they are not doing it right. They are holding the entire arm parallel to the water, and this is wrong because it does not relieve the muscles of the forearm and elbow. The upper arm should be raised, the elbow pointing upward to permit the forearm to hang down almost perpendicularly, and then go forward on a sort of pendulum swing. This releases the muscles of the forearm and elbow and puts the burden on the shoulder muscles, which are big and strong enough to carry it without effort.

As my right arm comes over the water to the front position, my left arm ploughs through the water in its propelling drive and my head starts to turn on a pivot to the left. My right arm at full reach comes down on the water to make the catch of the hand and the left arm is brought out of the water with the elbow bent.

As the left arm comes up relaxed, my body is slightly raised on the left side due to the roll

necessary to bring the arm out of the water in recovery and to get the face clear for a breath. I do not have to turn my head so much to get my face clear, as the speed with which I travel makes a hole on top of the water, a kind of wake forming a cup or dish, so that I don't have to raise my head at all for inhaling. I merely turn it on a pivot, the axis of the head still pointing straight ahead.

While my face is buried in the water, I exhale through my nose. With my face turned to the side, I inhale through my mouth. Here is a point to get clear, as it is fundamental in breath control in the water. *Exhale through the nose, inhale through the mouth.* There are good reasons for this which will be explained fully when I take up breath control more extensively in Chapters X and XI.

To return to the arm stroke: the right arm, as I inhale, has already begun propelling — there is never an instant throughout the consecutive revolutions of the arms when some pressure is not being exerted upon the water. As the left arm goes forward in recovery, my face is turned into the water again. Thus I have completed

one and a half revolutions of the arms — the right arm coming back to the hip having done one and a half, the left arm making the forward catch having done one. As I started the description from the plunging position wherein both arms are extended forward, the right arm had to do half a revolution before the left arm could start, as the arms are always equidistant throughout the stroke.

In the sweep of the arms my elbows are bent to an angle of about forty-five degrees. In recovery they are bent still more, so they may be swung forward with that hanging-down motion of the forearm. To carry them forward unbent and outward would not only be awkward, but take too much time and effort. In carrying the arm forward, I do not allow it to touch the water until it is fully extended in the advanced position, and then it makes a clean catch ready for the downward drive.

This clean recovery is not always apparent in the movies I have reproduced, as there is a lot of spray flying around, and the action is sometimes too swift for the camera. Later on I will further analyze the proper action of the arms.

You will notice that for the most part I keep my face buried in the water, the surface breaking just a little over my brows. Every time the left arm comes up, however, I snap my face to the left, using the neck as a pivot, bringing the mouth clear for a wide gulp. Then I snap my face back into the water. To extend this inhaling interval would tend to throw my body off the even keel which I try to maintain and would produce the roll which does not belong in the perfected crawl stroke.

It may look as if there is some roll of the body to the right side when that left arm comes up and my face turns to the left to inhale. But there is really very little. The turning of the face, the plunging of the right arm downward on its course, and the raising of the left arm give the illusion of a torso twist, but the movies showing my back prove that this roll is almost imperceptible. My effort is to keep the shoulders 'flat,' never dipping one shoulder down into the water, as this would destroy my hydroplaning position and cause resistance on such a dipped shoulder.

Now, let's take a look at what my feet have

been doing. For all you can see they've been thrashing straight up and down at a rapid rate. My legs, ankles, and toes are extended at full length and close together. At the widest stage of the up-and-down thrash, the approximate distance between my top foot and my bottom foot is from sixteen to eighteen inches.

I keep my legs almost straight except for a little play at the knees. This play at the knees is not only for relaxation, but for the propelling power that comes from the snaky undulation.

In the leg thrash the motive power comes from the hip by the use of the thigh muscles. The thrash goes down my leg past my knees to my foot with the hinge action at the ankles.

If you should try this apparently simple up-and-down thrash of the legs, you might find it less simple than it looks. Trying it without the use of the arms, you would not make very speedy progress. In fact, you might find yourself almost motionless so far as getting ahead is concerned. There is a trick of doing the thrash and getting propelling and lifting power out of it.

In the first place, you would find it almost

impossible to keep your feet below the surface of the water, and my feet are always below. Under Bachrach's instruction I have developed propelling power in my legs to an unusual efficiency. Its chief value is not in the speed it adds, but in the position it enables me to maintain, shoulders high, back arched — hydroplaning.

I swim with my chest and shoulders high in the water. This enables me to hydroplane, like a speedboat, reducing resistance to a minimum. I swim higher in the water than anybody ever did before, higher than anybody else does to this day. It takes speed to get up high and stay high without strain, but once up to that position, I get better speed with the same effort that I should use swimming lower at a slower speed.

This height of my chest enables me to arch my back, avoiding the strain of the swayback position which many have to take in order to get the face out of the water for inhaling. The high chest and shoulders and the arch of the back throw my feet lower in the water, where they maintain traction at all times. The up-and-down thrash of the legs and feet in the crawl

Fig. 1

Fig. 2

Fig. 3

ACTION OF ARMS AND FEET IN THE CRAWL STROKE

The faint line in each cut indicates the surface of the water

stroke tends to lift them up, and as a result the feet frequently break water, thereby losing traction, if the proper position is not maintained. If I did not swim with my chest high and back arched, I should have to reduce the power of my leg thrash in order to keep the feet down.

The secret of getting this propelling power, or rather lifting power, from the legs, still keeping them down where traction and push-up are secured, is only to be mastered after long trial leading to accidental discovery.

I employ my feet in a pigeon-toed action, which further complicates the task of describing the secret. If they went straight up and down in this pigeon-toed action, they would interfere with each other in passage. So instead of thrashing straight up and down, the toes weave in and out sidewise. I refer to the toes here merely as extensions of the foot, not as wriggling, independent members.

My foot undulates at the ankle. This hinge action enables me to get a push on the top surface of the foot going down and on the sole of the foot coming up. If I held the foot rigid, the down stroke would drag water against the top

surface of my foot, hooking it against progress.

This weaving in and out of the toes and this hinge action are done without conscious direction. Your feet will go that way naturally if you are really relaxing at the ankles. They take this sidewise flip or slap to deliver the upward push that provides the propulsion to sustain the arch of back and the high chest. Most swimmers want to hold the legs and feet in one stiff line from hip to toe, and it takes a lot of practice to get on to this relaxation in the ankles that lets the feet flop pigeon-toed in the effective manner.

With the slight play of the legs at the knees, and the slapping of the pigeon-toed feet, this leg drive becomes a fairly complicated affair. Somebody has called it a pedaling motion. Bachrach insists that it is a whiplash motion, as I use each leg as a whip, the foot as a lash, and get a tremendous snap to the whole thing by the proper coördination of the various parts. This whiplash has the driving power.

It is important in considering the feet to remember to forget them, after you have once mastered this mysterious trick. I never think about what my feet are doing.

The reason is that the legs produce so little propulsion, in comparison to the speed provided by the arms, that they are virtually little more than trailers in propulsion, when your arms are going at full speed and efficiency in short sprints. They are used mostly to maintain position, to keep the legs from dragging low in the water where they would go if you did not use them, and in my case to help me keep up that arch of the back that holds my chest high and the back of my shoulders out of the water and the front of my shoulders *almost* out of the water.

Legs, properly understood in the perfected crawl stroke, should be used chiefly for this purpose of maintaining position; to try to get real propelling power out of them would burn them up in fifty yards, while your arms would not be contributing their full share of the propulsion. In some strokes the legs are paramount; either the arms or the legs must be paramount — there cannot be equality in their contribution to propelling power. In the crawl stroke the arms provide from seventy-five to ninety per cent of the propulsion.

CHAPTER IV

FINE POINTS OF RACING

When I said that I concentrate on my stroke and swim the best I know how, I did not mean that I use all my strength and power, going at my utmost speed, all the way. Swimming, unlike almost all other athletic activities, requires relaxation. It requires relaxation not only for the preservation of strength, but for the perfect execution of the stroke. This matter of technique will be explained in due time.

One thing most young competitors ask is whether it is best to sprint at the start, the middle, or at the end of a race. My theory of the best way to race is not to sprint at all, but to find the fastest gait you can hold over the distance you have to go, and then hold that even gait all the way. By this I don't mean that you swim at your utmost strength and power, because, as I pointed out, this destroys relaxation. You swim your fastest, yet somewhat within your power, for this is the only way to achieve the style that makes for efficiency.

Then, if you need a little extra power in order to win at the end of the race, you can call upon this reserve. There is a fine distinction between swimming within your power and retaining a reserve, on the one hand, and holding back until the last few yards and then sprinting. A fine distinction, but a real one and an important thing to understand clearly.

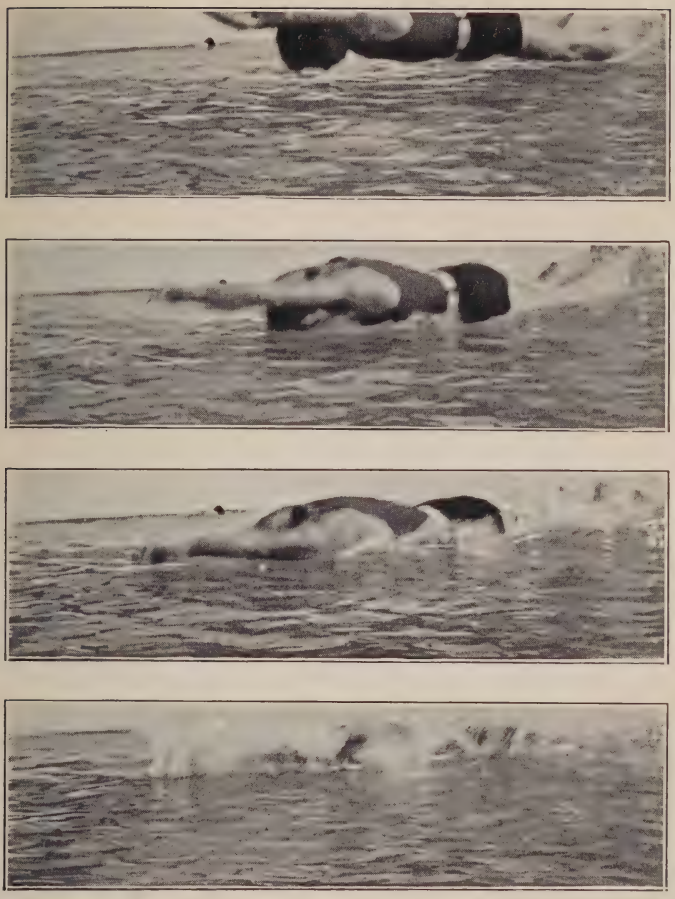
Many swimmers are such poor judges of pace that it is next to impossible for them to apportion their energy equally over a course so it will just about run out in the last few yards. They either kill themselves by early sprinting or withhold for a sensational finish energy that would have been better employed sooner. If a swimmer is inclined to hold back, I would advise him to start his sprint much earlier; that is, instead of sprinting ten yards, sprint twenty or thirty.

The trouble with a violent sprint at the end is that you cannot get increased results comparable with the increased energy expended. In other words, you are fooling yourself. Spreading the sprint over a longer distance is bound to reduce the violence of your efforts, improve your relaxation, and therefore enhance efficiency.

In the account of my race with Kojac, in telling about the start I said we were all off simultaneously. I should have excepted myself, because, in this race and in most others, I was last off the mark. I am usually slow getting from the mark, though not so slow as to attract special attention. I have found it to be my natural inclination, and it has its advantages quite apart from the avoidance of false starts.

My coach says my reflexes are slow. By reflexes he means my actions following the reception of a signal. That is one reason that I seldom anticipate a gun and why I am usually last off the mark.

In addition to that, I make more preparation. Where my opponents are anxious to get off, regardless of the form with which they make the plunge, and therefore do not take time to get fully coiled for the leap, I take all the time I need. I learned that the important thing is not to get into the water instantly, no matter how, but to get into the water right. By taking more time to get prepared properly, I not only avoid a false start, but my plunge carries me farther. I get more leverage and more strength behind



FOUR MOVIE SHOTS OF THE SHALLOW PLUNGE

To get my stroke going as quickly as possible after hitting the water, I make a shallow plunge. This is accomplished by raising the arms high overhead and raising one leg, the right leg, as it happens to be in this picture. I watch the water to time my slap of leg and arms exactly. The second picture shows my right leg coming down, and also my arms. Third picture shows my leg hitting the water and my arms almost in contact. I make a tremendous splash with arms and leg in order to prevent a deep plunge which will delay the start of my stroke.

my spring. As a result, by the time I reach the end of my plunge I am nearly even with or ahead of my rivals, who have plunged earlier but with less preparation.

In my plunge the body is in a fully extended position, arms held out in front, legs straight out in back, imitating an arrow as closely as possible. My body goes nearly parallel to the water so that I make a fairly shallow entry.

My starting plunge is worthy of a little extended study. In the picture shown herewith you will see my start. It is different from that done by any other swimmer I have observed. Note first the position of my arms, high above my head. Notice that my head is down and that I am looking with open eyes at the water. Note also that one leg is raised much higher than the other. These things do not just happen; every point here means something.

When I hit the water, I bring my arms down with a powerful slap, and at the same time I bring my raised leg down with a strenuous plop. I look at the water so as to time this slap of the arms and leg exactly at the moment of my entry into the water. This slap of the arms and leg

keeps me high in the water, while other swimmers take a deep plunge. They are a long time coming up, and this delays the start of their propelling operations.

Making the shallow plunge, keeping high in the water by slapping down with my arms and leg, I am ready to begin swimming sooner than my rivals.

Proper turning at the ends of the tank is very important in speed swimming. Racing in sixty- or seventy-five-foot pools, you make a great many turns in the course of a two hundred and twenty- or four hundred and forty-yard swim, and if you are slow or awkward on the turns, losing a foot or a yard on every turn, it mounts up to a big sum before you are through. For instance, if you are swimming a quarter mile in a sixty-foot pool, which takes twenty-two lengths and twenty turns, the loss of a yard at each turn will cost you twenty yards, a tremendous handicap to give any rival.

For a long time I was poor on my turns. I was not only slow, but I slipped and floundered around and didn't get the full distance on my push-offs. I was not bad enough so that the

uninitiated could notice it, but I realized I had a handicap and so did some of my team mates.

In the hundred-yard sprint the efficient turn is probably more important than it is in the longer distances. The rest to be gained by a slower turn may be of value in the longer race, but in the hundred, the question of endurance does not enter, and it is worth while putting all the energy needed into an efficient turn.

Perry McGillivray, who was the world's greatest in his day, was the most skilled sprinting turner I have ever seen. Perry saw the chance of cutting down my time by improving my turns, so he urged me to try his system. He said I had been trying to turn flat on the surface of the water, and that was all wrong for sprint swimming. He told me to make my turns as follows:

'As you swim up and touch the end of the tank with the tip of your right hand, turn your left ear down and go down deep into the water. Do not touch the end of the tank with your left hand, but use it as a paddle in the water to aid the body in pivoting on that left ear. Go deep

into the water and make your push-off, and as you shoot away, plane upward until you hit the surface just at the right place to begin your arm action. You see, this is different from the starting plunge, which you make shallow, whereas the push-off should start deep.

'In the hundred-yard sprint you do not have to take a breath during the turn and push-off. You do it so quickly that it will not interrupt the rhythm of your breathing to any extent.'

When you are swimming the hundred yards, you do not slam against the wall with your right hand. This stops your speed. You do not need the wall to turn on, because your speed will carry you around. When you swim in close to the wall, your right arm immediately begins turning, and you just brush the wall with the tip of your fingers and the side of your hand and your forearm. As far as you are concerned, the wall does not interfere with your speed, does not check you in the least, and you touch it only to comply with the regulations and prove that you are going the full distance to the inch.

Well, I mastered that style of turning, and it made a real improvement. It came at a time

when some of my records were getting hard to exceed, and I have no doubt it contributed fractions of seconds or more to the new records I made following its adoption.

CHAPTER V

HOW OTHERS DO IT

HAVING described the way I swim the perfected American crawl stroke, it might be worth while to tell some of the methods of other sprint swimmers in order to emphasize some of the points I have made as well as to bring out some new ones in a significant manner. Every swimmer I have seen in fast competition does one or two things, some of them many things, differently.

There may be merit in their different ways of doing things because of being better adapted to their peculiar gifts; or they may get speed in spite of some of the things they do. Arne Borg is an outstanding example, I believe, of one who gets phenomenal results regardless of what I should call faults of technique. Walter Laufer and Norman Ross are others. They get results in spite of shortcomings in style because of great strength and power. By that I mean organic or functional strength, not merely muscular bulk.

Why do I breathe on every stroke, exhaling through the nose when my face is down in the water, inhaling through the mouth when my face is turned to the side? Most sprint swimmers take a breath only on every third or fourth stroke or complete revolution of the arms. In swimming forty yards in a sixty-foot pool, for instance, they will take perhaps one breath going the first length and two coming back. Perry McGillivray, who takes about ten strokes to the tank length, inhales only three times to a length, or on every third stroke. They figure it is a waste of time, a disturbance of the even keel, and an interruption of the rhythm of the stroke to breathe oftener. And it is, the way they do it. But not the way I do it.

In the first place, I waste no time when I breathe on every stroke. Where the infrequent breather is practically coasting in order to keep his mouth clear long enough for a deep lungful, which he needs in order to make it last until he gets his next breath, I take a short breath, a quick bite, because I'm going to get another breath right away and don't need to stuff my lungs. In the second place, I work my

breathing, my turning of the face to the side, into the rhythm of my stroke. The boy who breathes less frequently must break his rhythm.

A swimmer, to keep strong in the water, must have plenty of air, and must have it in as near the natural way as possible. Can you imagine a hundred-yard sprinter on the cinder track inhaling only every now and then, in the mean time holding his breath or letting it out slowly? He would drop dead before he got to the finishing tape.

Now the natural way is to keep up continuous breathing. That is, the moment inhaling ceases, exhaling begins, and so on. Air is either coming or going, rapidly, at all times. If, in swimming the crawl, you breathe less frequently than on every stroke, you must hold your breath. That destroys relaxation, which is fundamental in swimming, robs the blood of oxygen, and punishes the heart. Your lungs cannot burn carbon dioxide, which is all that is left of the air after the instant the lungs are filled and have extracted the oxygen. I get plenty of oxygen by breathing on every stroke, and that keeps me strong.

Further, the swimmer who breathes less frequently than on every stroke usually has to twist his body to bring his head up. This throws him off of the even keel which he should maintain to avoid unnecessary resistance, and it takes effort, which is wasted because not applied to propulsion.

Another difference between my technique and that of most of my rivals is in the number of strokes used to go a given distance. In a sixty-foot tank, for instance, I go the length of it in five and a half or six revolutions of the arms. Others take seven, eight, nine, and ten revolutions.

In this matter of the number of strokes of the arms to the length of the tank, I should like to add some further qualifications. When I am swimming a hundred yards in the sixty-foot tank and want to do it in about fifty seconds, I use only five strokes to the tank length. This is made possible by the powerful push-off after making the turn at the end of the tank. All during the length of this push-off I am under water, and the longer the drive I get, the longer the time I must go without getting new air into

my lungs. As the hundred-yard sprint is soon over, I can afford to take this punishment for the sake of the speed derived from the long push-off.

However, when I swim more slowly for the hundred, or swim a two-twenty, I take about six strokes to the length. This means that I reduce the power of my drive in the push-off so that I can come up for an inhale sooner. For other distances up to five hundred yards, I increase the number of strokes to seven, still further shortening the push-off. These longer grinds require more relaxation and more frequent breathing. The more times you can breathe, within reason, the better you will maintain your strength and endurance.

There is more advantage to the use of fewer strokes than the mere saving of energy, though this is of course an important matter. One reason I take fewer strokes is that I have more powerful shoulders and longer arms and get better leverage. But there is a still more vital reason for taking fewer strokes, and I give my coach the credit for bringing home to me an appreciation of this factor.

Water, as I have pointed out, is a solid but yielding substance. If you take a great many strokes to go a given distance, it means that your arms are traveling faster through the water at each stroke than if you took fewer strokes to go the same distance. If you thus stroke with too much speed, you 'cut holes' through the water, and you can't get propelling power out of holes. The arm thrashing violently through must shirk leverage and spill purchase water over the forearm and out of the hand.

The secret of taking fewer strokes is to start the stroke slowly and gradually increase the force as you feel that you are getting a purchase on the water. In this way you will not attain the full force of your arm stroke until the arm is nearing halfway of its sweep. Shortly after passing the middle of the stroke, the action changes from a pull to a push, thus following through with the purchase you have obtained. This change from the pull to the push is very important to get in mind.

Another point to remember, though I don't say that I differ in this detail from my leading rivals, is that there is no leverage of value to be

secured at the very beginning of the catch of the hand in the advanced position. For this reason it is poor judgment to reach out too far ahead. I do not extend my arm its full length, but at my farthest reach I still have my elbow slightly bent to reduce this advanced reach. This not only avoids the waste of time in reaching too far ahead, but it avoids spending energy where it is not effective.

I notice in some swimming articles written by Arne Borg that he advocates making a long reach in front, but I think he is mistaken in this. His own pictures show that he makes a reduced reach by bending the elbow, which is the proper way to make the reach. Borg takes more arm strokes to go a given distance than I do. The reason is that he does not make a full stroke with the arms. He makes a choppy sweep sidewise and makes practically only half a stroke. His hand sweeps out and then in, instead of coming straight down from the shoulder with a pull, and then back and out with a push, as I do.

Norman Ross, in making this forward reach, crosses over a bit with his right hand; that is, he reaches to the left of a line straight forward

from the shoulder. Also, his shoulder and elbow dip down into the water before his hand. This crossing with the hand and dipping the shoulder and elbow cause a lot of resistance to the water on the forearm, the elbow, and the shoulder, which I avoid by making my catch straight in front of the shoulder, dipping the hand first and keeping the shoulder up. Ross does not have this fault so much with his left arm.

Still different is the arm action of Walter Laufer. He also crosses with his right hand, but his chief weakness is that one arm is stronger than the other. Instead of dividing the propelling burden equally between the two arms, he gets a tremendous pull with his right arm and very little with the left, so that his progress is almost as jerky as that of the trudgeon swimmer. He does not swim as high as I do — dips his shoulders a little; but in spite of these weaknesses, he gets wonderful results. If he could eliminate them, he would be that much better.

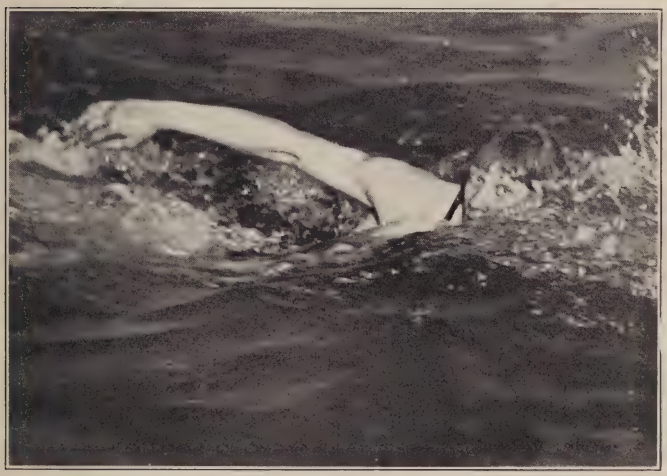
I have told something about my leg beat in the previous chapter. This is probably the most elusive subject connected with the crawl stroke, and it has given rise to endless arguments. It

is the chief point of difference between the Australian crawl and the American crawl. In the last half-dozen years it has become generally recognized that the American-crawl leg beat is the superior of the two; yet there are almost as many different styles of American-crawl leg beats as there are swimmers.

The Australian-crawl leg beat is a hangover from the scissors kick of the trudgeon stroke. Dick Cavell is generally credited with the evolution of the crawl from the trudgeon, which in its day was the speediest stroke until superseded by the crawl. Most of the Australians thrash the legs straight up and down, but they kick from the knee. The American-crawl beat operates, not from the knee, but from the hip. The leg, while not held stiff at the knee, is used more as a unit from hip to toe. This gives twice the length of leverage.

Perhaps just as important, or more important than the length of the leverage, is the superior power to be obtained from the thigh muscles. And, further, the thrash from the knee has a tendency to raise the feet out of the water. Consequently, the Australian swimmers are

ETHEL LACKIE SHOWS RELAXED RECOVERY OF THE ARM
The arm is bent at the elbow and relaxed at the wrist



AN EXAMPLE OF WALTER LAUFER'S ARM ACTION

always breaking water with their feet. Breaking water with the feet means losing traction.

To operate the leg from the hip, therefore, not only affords longer leverage and better power, but keeps the feet lower in the water where superior traction is obtained, and avoids breaking the surface with the feet.

Next time you see an Australian swim his typical crawl, notice what a terrific wake he churns up with his feet. This is due to the fact that he is thrashing the surface of the water, breaking traction on nearly every beat of the feet.

Then, too, the Australian does not get that elusive pedaling motion, the whip action of the legs and feet which I have explained at length in the previous chapter. And that, after all, is the real secret of the superior propelling power of the American leg beat. It is hard to describe and almost impossible to learn except by the 'trial-and-error' method.

Ross has a very peculiar leg action. He takes a few narrow flutters, and then, as he rolls to the right side in making the right-arm pull, he takes one very wide flutter. This looks like a

scissors kick, but it is not, as it is straight front and back, not out sidewise and then back together. It looks like the scissors because it is made in the horizontal plane, not in the perpendicular, and is so much wider than the usual crawl flutter.

Within the limits of the American-crawl leg beat many arguments arise over the number of leg beats to be taken with each revolution of the arms. There is the straight six-beat, and the straight eight-beat, and there is the double-trudgeon beat, and as many combinations of numbers of beats as you can imagine.

When anybody tries to involve Coach Bachrach in an argument as to how many leg beats should be taken with each revolution of the arms, he laughs and waves the whole argument aside. He taught me that, as the arms were the main propelling force in the crawl stroke, the legs must be subordinated. There is power in the leg beat, enough power so that it is probably in this department that I gain my margin of superiority over rivals. But this power is chiefly to maintain a high body position and it is secondary, and attention must not be concen-

trated on it at the expense of the arm action.

I have found it valuable to vary my leg beats according to whether I am swimming in salt water or fresh water. Salt water being more buoyant, the legs are needed much less to keep the body in the high, hydroplaning position. I worked this out in Honolulu one time, and the result was highly gratifying for distances over one hundred yards.

In practicing at home in the I.A.C. pool, I had noticed that when I placed my feet in an inflated rubber tube and did not use them at all, employing only the arms, I was able to keep going indefinitely without tiring; whereas if I had also used my legs, I should have tired.

When I got to Honolulu and was swimming in that unusually buoyant salt water, I found that the rapid leg thrash lifted my feet too high in the water and I was breaking the surface with my feet. So I reduced the leg beats from six to two, one on each arm. I found this was enough in that buoyant water to keep my position high, and I broke the world's record for a two hundred and twenty-yard swim, and the world's records in the four hundred and forty-yard and

eight hundred and eighty-yard national championships.

Then I tried the same thing, training for the hundred-yard championship, and I found it didn't work so well. I found that using the wider arm stroke, to get greater leverage for the faster speed at the shorter distance, made my legs spread apart with the two-beat action, so I had to go back to the faster leg thrash, which is the six-beat, three beats for each arm.

After all, what everybody is seeking in trying to regulate the number of leg beats is proper coördination with the arms. The legs aid in supplying the high position and the continuous headway which differentiate the progress of the crawl-stroke swimmer from that of the trudgeon- and breast-stroke swimmers. In these strokes the progress is jerky and intermittent.

CHAPTER VI

CAN THE CRAWL BE IMPROVED?

My technique has been called the 'perfected' crawl stroke because it reduced water resistance to the minimum; it facilitated a method of breathing that most closely approximates the natural, involuntary method of nature; it put the body in a position to make free and unimpeded use of all its strength and power and leverage, and it got the most propulsion for the effort expended.

Some say there is still room for improvement in this stroke. I do not see just where the improvement will come. I say this, not because it is my stroke, for the stroke really should be credited to Bachrach. I happen to be the first and most successful exponent of that stroke to date. Bachrach also has taught the stroke to Miss Ethel Lackie, who was a member of the I.A.C. girls' team, and she reached world's record dominance among women sprint swimmers shortly after I did among the men.

Miss Lackie approximates my stroke more

closely than any other swimmer in the world to-day, and its superior value is even more apparent in her case. More delicate and slight of build than any of her rivals, she earned her margin of victory by perfection of style in the stroke taught by Bachrach. She does not swim quite so high in the water, does not hydroplane so much as I do; but she swims with an ease and artistic grace that no man can hope to attain. Her stroke has been truly called the 'poetry of motion.'

I differ with those who claim that this crawl stroke can be improved by further narrowing and quickening the leg beats. Six or eight years ago — or maybe ten years — it was thought that the four-beat type of leg drive marked the limit of the stroke's practical development. A canvass among leading swimming authorities in 1917 disclosed that few of them thought the six-beat leg drive ever would be available for distances longer than one hundred or two hundred yards. Nevertheless, Miss Gertrude Ederle used the eight-beat crawl in trimming two hours from the men's record for the English Channel swim, a notable achievement. And other swim-

mers have used the ten-beat leg drive in winning championships at the half-mile and longer distances, proving that this rapid flutter of the feet can be maintained effectively and without undue effort, regardless of distance.

Exploits of Miss Ederle with the eight-beat, and of Miss Ethel McGary, for example, with the ten-beat, were considered by some as significant in that Miss Ederle started her competitive career as a six-beater, and Miss McGary as an eight-beater, and neither purposely increased the speed of her leg drive, but fell into the quicker thrash unwittingly, after several years of activity in the racing field. I think that this substantiates the principle laid down by Bachrach, that the leg beat should be governed, not by theory, but by the *feeling* of coördination.

I claim that in her case, what Miss Ederle does with her feet has no significance. She has such powerful arms and shoulders that she gets practically ninety-nine per cent of her propelling progress out of them. She swims more with her arms and less with her feet than any other swimmer I know, man or woman. Whether she

is fluttering her feet six, eight, or a dozen times to each revolution of the arms does not mean anything in her case, because her arms are pulling so powerfully that the feet are nothing but trailers. Her feet are not propellers even to the extent of maintaining a high body position. I believe she could swim every bit as fast if she had her feet tied together.

It has been observed that most pupils acquire unconsciously, as they become proficient, a faster thrash than they start with, and it is evident that the average swimmer has a tendency to speed up the flutters upon gaining skill. This is due to the fact that with increased arm power and skill comes increasing relaxation in the legs, so that the muscles can operate more rapidly because they are not carrying so great a power load.

Remarkable work has been done in teaching youngsters, from eight to thirteen years of age, and this has led to the belief that the earlier children are taught the crawl stroke, the more easily they learn to use a quick action of the legs, and that this inclination to teach boys and girls at an increasingly tender age will enable young-

ILLUSTRATING THE POWERFUL ARM-ACTION THAT DELIVERS NINETY PER CENT OF GERTRUDE EDERLE'S SPEED

ETHEL AND I 'HOLD THE POSE'

The stroke shown is faulty — heads too high, right shoulders too far down

sters of the future to master and use effectively a faster thrash than any now thought practicable.

However, I see limits to this increasing of the speed of the leg drive. Physicians say that energy used in the legs creates a greater strain on the heart than that used in the arms. The heart and the human system, of which it is the power house, have only a certain amount of energy. If you are using too much of it in the legs, you do not leave enough for the arms. And all this discussion about increasing the leg drive overlooks the fact that in the crawl stroke the arms provide seventy-five to ninety per cent of the propelling power.

This principle is proved conclusively by Arne Borg, who, in the four-hundred-meter race at Paris in the 1924 Olympic Games, did to me, over the longer distance, what Kojac did in the hundred-meter championship at San Francisco; but I had the reserve of strength and power needed to overtake him and beat him to the finish by inches in the last few meters.

For several years after Borg burst upon the swimming world, the experts tried to laugh him

off. It had to be admitted, of course, that he was breaking world's records here and there over middle and long distances. But his stroke was 'terrible,' they said, a deformity of style. He put all the power in his crawling arms and got little or no propulsion from his beating legs and feet. He fought the water from start to finish, scorning methods of reducing resistance and increasing relaxation.

Only his amazing energy could account for his performances, they said, calling him a freak for headlong effort and almost maniacal determination. When his store of energy was exhausted, which they anticipated any day, he would be done in short order. Nobody could rear and tear through the water as he did without burning himself out. The world of athletics had seen many go this way.

Aside from Borg's oversized heart and his strong constitution, I think his amazing endurance at a breakneck pace is due to the fact that he uses little or none of his energy in his legs. He puts at least nine tenths of his strength into his arm action, thereby emphasizing the major propelling factor.

His legs beat slowly, almost a trudgeon in cadence, with a wide spread between the feet at the extremities of the beat, and the trudgeon angle at which they cleave the water. Borg has never given the feet very much thought. Instead of trying to get traction with them, he mostly trails his legs along like a couple of threads.

Borg has actually tried to get his feet out of the way. In this connection he has a very interesting exercise. Ordinarily the top surfaces of your feet form an angle to the leg, causing resistance to progress in the water, like dragging a bucket after a boat. He trained his feet back like those of a toe dancer, so that the whole of the limb, leg and foot, forms a stream line. One of his exercises to achieve this training is to bridge the body between a chair and the floor, with his hands on the chair and his feet on the floor, top surfaces of the feet down. After assuming this position, he does a push-up exercise with his arms, letting his chest down to the seat of the chair, and then pushing up till his arms are straight under him. This not only strengthens the arm and chest, but bends the feet back.

He gets his feet out of the way, as if he did not want them, and naturally does not get the whip-lash propulsion for body position out of his legs that I do.

When Borg went to the Olympic Games in 1920, he was beaten by Norman Ross and Duke Kahanamoku, who seemed to get results more easily. So he decided to try to copy the Ross arm action and the Kahanamoku leg beat. I think he succeeded in the former, but not in the latter aim. He says, in learning the Ross arm action, he stood before a mirror and practiced hour after hour. That is a good hint for anybody wishing to master the arm action of the crawl stroke.

Even Borg's arm action, doing nine tenths of his propelling, is not so powerful as mine. We had an interesting demonstration of this one day in the I.A.C. pool. We got an inflated rubber tube and each put his feet in it. Then we started pulling in opposite directions, like a tug of war, and I was able to pull him all over the tank. My advantage came in the fact that I was using a full arm stroke, with a pull and a push, while his arms were doing a sort of stab-

EXERCISE BY WHICH BORG LIMBERS UP HIS FEET

This trains the feet back so as to avoid the resistance to the water offered by the top surfaces.

bing half stroke, a pull only, not followed through with a push. Another thing, he was not getting equal power out of both arms; he was leaning on his right arm in order to turn his face up to inhale on the recovery of the left arm, and you can't lean on that right arm and make it pull at the same time. He gets much more propelling power, I believe, out of his left arm. I mention this, not in a spirit of boasting, but as a scientific experiment to determine which method of using the arms delivers the greatest efficiency.

Borg's listless leg flutter is of no value in maintaining the high body position. His high chest can only be explained by the short choppy stroke he takes with his arms, which must be used in a way to buoy as well as to propel. He must press down upon the water in order to support his trunk in the high position, thus giving the arms an extra task when all they should be asked to do is to propel. I avoid this fault by assigning to my legs the task of buoying the body, while my arms do nothing but propel.

This fault makes Borg's stroke good only at a

certain speed, and that is the top speed; and this accounts for the fact that he always swims the same speed from start to finish, whether he is going 220 or 880. He cannot swim a single hundred any faster than he can swim each hundred in an 880, and that is why he has failed to break records in sprints the way he does at the longer distances. When he tries to use his method of swimming at anything less than top speed, his legs drag low in the water, and he cannot achieve a hydroplaning position of the chest. At anything less than his breakneck speed over a good distance, he is a very ordinary swimmer.

This argument about the rapid leg beat disqualifying the crawl stroke for long-distance swimming reached an interesting height when Gertrude Ederle swam the English Channel, followed in a short time by two other crawl-stroke swimmers, Mrs. Corson and Ernest Vierkotter. For years the old salts around the Channel ports insisted that no swimmer using the crawl stroke could ever hope to swim across the Channel, but the records made by these three swimmers should convince them that it is

the one real stroke because it is the most natural.

When Miss Ederle went to Gris-Nez, her trainer insisted that she change both her stroke and her style. He was an expert of the old school. She listened to him and, like a baseball batter, who starts experimenting with different stances at the plate, she was thrown clear off her natural style. Other experts also cautioned her against attempts at speed. They said it was difficult enough to swim across the Channel without trying to make records. On her attempt that failed, she was constantly warned from the tug to decrease her stroke and not to try for speed.

American trainers, however, who were developing the crawl stroke against the ridicule of foreign experts, felt sure it was the best stroke even for Channel swimming, and in encouraging their pupils to develop speed they were actuated by the logic that the easiest way to get there was to get there quick as long as the stroke was not too much of a strain.

Success of the three crawl-stroke swimmers in one season was therefore hailed as an American

triumph, because it was a vindication of the crawl stroke, perfected in America, for distance as well as sprint swimming.

Greater development of the crawl stroke may come, but I don't see how. Better records may be made, but that isn't saying that improvement in the technique of the stroke will be responsible. Youngsters to-day are making better time than any of the ranking senior stars showed at a corresponding period of their development, and with perfect execution of the stroke and the physical development that swimming brings with maturity, it is only reasonable to expect that they will exceed my records.

If my records are beaten to any great extent in the near future, it will be due to superior physical endowment, coupled with perfect execution of the stroke as now conceived.

CHAPTER VII

MY METHODS OF TRAINING

You may not believe it, but my championship life has not been all parade and no work. I had to do my stuff every day, whether anybody was looking or not. To keep in shape, once I had arrived, required more work from me and any other athlete who ever flipped a fin, as far as I have been able to learn. I've been a record-breaking eater and required extraordinary physical effort to burn up my food.

It's that way with most swimmers, more than with other athletes, I believe. Swimming makes you hungry; in addition to the energy you spend, the water draws heat out of the body, and right away you need new fuel to stoke the heating plant.

In the first year or two I was in the water most of the time, of course. But after the first dozen or two of world's records, it began to be an old story. Many times Bachrach had to drive me into the pool. I'd drift down to the club pool in the afternoon after school, sit

around and read the papers while Bachrach finished his siesta. When the Big Boy came out of his hibernation and spied me, he'd say:

'Hey, what are you doing here? Get into that pool!'

'Don't feel like it,' I'd come back, yawning.

'Get undressed and get in there,' Bachrach would say, without batting an eyelash.

'Oh, I've just ordered something to eat,' I'd say. 'I'm getting a club sandwich.'

'Never mind that club sandwich,' Bachrach would reply. 'I'll take charge of it. You get OUT of those clothes and IN that water.'

It is hardly necessary to say that I'd get 'out' and 'in,' for various reasons. Maybe I wanted to go to Buffalo for a meet next week, or I was figuring on going to Cincinnati two weeks later, where they always make a big fuss over me. So Bachrach, who could say whether I would go or not, didn't need to threaten; his word was always law with me.

Now, there are two distinct departments to this business of training. One is for the young swimmer, with lots of promise, but no knowledge of style, pace, or competitive strategy; the

other is for keeping the champion in condition, constantly improving, after he has once arrived. These departments are interwoven somewhat, of course, and it will be best to take up what the coach did for me before I arrived, and then go into the other matters later.

Bachrach did not allow me to employ my full speed until several months had been devoted to experiment, study, and practice. Even after I broke into competition in a few try-outs, 'Bach' seldom swam me against the watch in practice to find out the greatest speed of which I was capable.

It is a mistake, he says, to time even the veterans very often. There are some very good reasons, borne out by his years of experience in the development of champions, for his method of training me in the early days. These will be given later.

First he told me to swim up and down the tank at about sixty to sixty-five per cent of my greatest speed. He explained that the purpose of this was, first, to show him my style of stroke at best advantage, and, second, to make it possible for me to swim a greater distance with

ease and pleasure than I could if I swam faster.

He advised me to take a good long swim and not to stop until I was tired. During this time he watched me, and when I was through, anxious to hear what he had to say, he criticized my breathing, my arm action, my relaxation or lack of it, my position in the water, my leg beats, my turns at the end of the tank and other points.

Bachrach gave me a good talk and told me what I should do to improve. I was to be turning these things over in my mind and have them well outlined in memory before I came for my next work-out.

My work-outs were a daily affair. Regularity was most important. Each time he had me swim a little longer, making progress until I was swimming a quarter of a mile each time. This calls for twenty-two lengths of our sixty-foot tank. The quarter-mile is the ideal distance for training. During this stretch I had plenty of time to work over the ideas Bachrach gave me before entering the water, experimenting until I made the corrections in execution of the various parts of the stroke.

I had plenty of time for study because I repeated the same operations over and over. For instance, during the quarter-mile I made twenty turns at the ends of the tank. Between the turns I made six or seven revolutions of the arms, and inhaled and exhaled something like one hundred and fifty times.

When the water was low in the tank and the end rails were near the surface of the water, I was instructed to avoid using these rails in turning. In the first place, it is a slower turn to reach out and feel for the rail, grab it securely, pull yourself up to it, turn, let go of the rail, and shove off.

Secondly, if you become accustomed to the rails, you are lost when you get into a tank that does not have rails. Independence of the rails may mean the difference between victory and defeat in a close race. Swimming without regard to the rails, you drive in to the end wall with more speed and decision, get closer, turn more cleanly and with a graceful rhythm, and being closer you get a better push-off.

During this quarter-mile swim I studied the purchase power I got on the water with my

hands and forearms. Water is elusive, but you can get 'hold' of it if you know how to go after it. As I have explained earlier, the most effective way to go after it, of making the arm stroke, is to start the catch slowly, and then gradually increase the power as you near the middle of the pull and feel the pressure on the hand.

I resisted also the tendency to roll the body from side to side. The ideal crawl-stroke position is with the body lying on an even keel on the chest, rolling as little as possible. I found that when I was working a little better than half my maximum speed, just jogging along, I had to watch against this fault of rolling from side to side.

This roll is bad for several reasons.

First, it is lost motion, and all motions not contributing to propelling power should be eliminated, whether they are a positive impediment or not.

Second, the roll means that you are depending on it to bring the mouth clear for inhaling. I had to learn to inhale without shifting the balance of my body any more than could be helped. Swimming high in the water as I do, I

Fig. 4

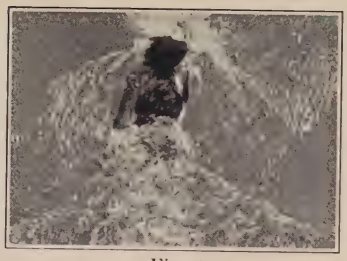


Fig. 8

Fig. 3

Fig. 7

Fig. 2

Fig. 6

Fig. 1

Fig. 5

EIGHT SHOTS FROM THE MOVIES SHOWING MY BACK

(*Read from bottom up in each column*)

can get my mouth clear simply by turning my face to the side.

Third, the roll, which carries the right side of the body down when the right arm dips for its pull, and the left side down when the left arm dips for its pull, shows that you are not using your arms in the most efficient style; you are throwing too much burden on the feet, or you are actually loafing.

And fourth, you encounter resistance on the dipping shoulder and upper arm.

When you roll on the down arm, instead of really pulling water with the arm you are simply letting the arm drift through the stroke in the easiest position. The chances are you are not bending it in the fashion that offers the most surface of the forearm and divides the power burden between the shoulder and the elbow. Maybe you think you are dipping deeper to get better leverage. If so, you are fooling yourself, because with the stroke properly executed you can get more leverage nearer the surface than your strength can handle. There should be no coasting on the arm that is properly employed in this stroke.

Again, I was cautioned against jerky movements of the arms, either in the stroke or in recovery, as this meant that I was not only performing incorrectly, with relation to purchase power and leverage, but not getting relaxation. I was told to watch my relaxation, mental poise, ease of breathing, and the limberness of every member of my body.

In recovery of the arms I was told to bear in mind that my wrist and elbow were to be brought up out of the water relaxed. When my wrists and fingers flopped loosely at the joints as I carried the arm forward in recovery, it was a good sign that I was relaxing.

Swimming at a little better than half speed, I had a good chance to keep my attention on these things. If I went through these studies at my greatest speed, perhaps swimming against a watch held by somebody outside the tank, what would I be doing? I'd place myself under mental and physical pressure to make the best possible showing. I'd find myself, despite my resolution, fighting by main strength to make speed, forgetting my instructions.

Form and not *fight*, results in good swimming.

If I had had to make fast time in those early days, I'd never have mastered form. I couldn't have thought about or even held in memory the instruction given me. I should not have been able to observe the various points of technique to see whether I was executing them properly, and the chances are I should have executed them very badly.

I should have found it impossible to relax, to breathe properly, to avoid unnecessary resistance motions, should have forgotten all about style, and style is ninety per cent of speed. I should have tired myself out long before the quarter-mile was over, got winded, quit the tank exhausted, depressed, and perhaps discouraged.

Maybe one of the reasons Bachrach and I have always got along so well together, and why I continued for so many years in amateur competition, was that he always insisted that swimming should be a pleasant experience, and between swims lots of good things to eat, good times, good fellowship, and plenty of sleep.

After all, such methods are soundly based on psychology. We are not machines of muscle

and bone and blood alone, and we are not mentalities alone. We are a combination of both, and, since he recognized this fact and acted accordingly, Bachrach and I always got along well together.

CHAPTER VIII

HOW I KEEP FIT

Having thoroughly laid the foundations for good training in the formative days, I am now ready to tell about the things I did to keep in shape and kept on improving my style and my speed. I will also tell how I regulated my diet, and what I did outside the tank to keep in good health.

First I dive into the tank for my daily work-out and swim several lengths to work up good circulation and get limbered up. Then I begin taking my stroke apart and practicing each part separately.

First I do the leg thrash alone, making no use of my arms. This exercise is done by getting a polo ball, an inflated rubber tube, or some floating object that will support the weight of the arms. You place your hands on it and push it out full length in front of you. It should be buoyant enough to raise your chest about as high in the water as your arm stroke would if you were using your arms. With your legs

extended to the rear, you start the leg beat. Make the motive power come from the hips, flexing the legs at the knees and ankles. Go up and down the tank as many times as you can comfortably at a fast speed, using only the leg thrash, and quit as soon as you begin to tire. Don't keep it up after you have ceased to get pleasure from the exercise.

It is important that you do not continue this leg-thrash exercise too long. As soon as you begin exerting yourself unduly, straining to continue the grind, you lose relaxation and your mind cannot concentrate on a study of perfect form in executing this complicated movement.

In practicing the leg thrash, I pay particular attention to keeping my feet toed-in. This toeing-in is the only way to relax the ankles and get the proper whip flop that yields propelling force. If you toe straight up and down or outward as most people do in walking, you cannot get the top surface of the foot turned out of the way. It then offers resistance against progress and tires the ankle.

By toeing-in you not only gain relaxation at

Fig. 1

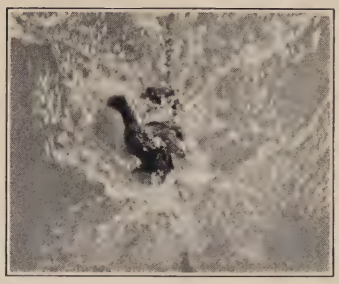


Fig. 2

Fig. 3

Fig. 4

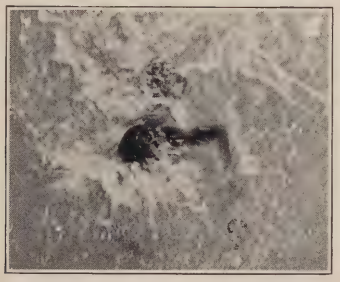


Fig. 5

FIVE MOVIE SHOTS SHOWING STROKE FROM THE FRONT

This series shows the line my hands follow in the water. They do not sweep outward, but down on a line with the shoulder. 1. Left arm has just made its catch, but propelling has not started with this arm, as the right arm is finishing its follow-through of the push. 2. Left hand still feeling for the purchase as right arm comes out. 3. Left arm has started its pull as right arm comes round and bends at the elbow in recovery. 4. Left arm has made its propelling pull and push and has started recovery. 5. Left arm being carried forward in recovery as right arm does its work.

the ankle, but you place the top surface of the foot in a plane which produces propelling motion. You get a better purchase on the water. Most of the leading swimmers of the I.A.C. have mastered this trick and place a great deal of importance on it. It is worth while spending a lot of time and attention on this detail of form.

When I tire of this leg practice, I give it up and then take some exercise with my arms. I put my feet in an inflated tube to keep them up high, maintaining somewhat the position of my body that I should show if using the legs in the thrash. Then I swim up and down the tank, using arms only.

This gives me a chance to study my arm action, to see that I am bending the elbows about forty-five degrees, getting purchase power on the broadest surface of my forearms, and not letting any leverage go to waste by spilling water out of the hands. The hands spill water when you do not cup them properly, when you spread the fingers, and when you turn them sidewise. Naturally, turning the hands sidewise is the worst fault, because then the hands cut through the water instead of pulling through.

You will turn them sidewise unconsciously if you are getting too much leverage, and then your arm stroke and the energy you have put into it go for nothing.

If you are reaching too wide with your arms, thereby getting more leverage than you have strength in your shoulders to handle, you will coast through the stroke instead of applying propelling power. This is the fault that needs most careful watching and a lot of experimenting to find the most effective angle at which to bend the elbow, the angle that will enable you to keep the hands pulling instead of cutting.

After getting enough of this exercise, I often practice turning. Using the full stroke, combining arm and leg action, I swim back and forth across the short width of the tank. The short width will give you more turns for the yardage you swim.

Practice these turns across the short width of the pool until you think you have had enough of it. Then taper off your practice by swimming a few lengths of the pool with the combined stroke, paying attention to coördination of all the parts of the stroke, and concentrating on

relaxation. Then you have nothing to do till to-morrow, as far as the water is concerned.

Training in the early formative days was one thing; and training to better my world's records after I had arrived was something different. Once I had mastered form and had established myself as a record breaker, I adopted a different system.

When I set out to break a record, I begin training a week or two ahead to swim exactly the time I expect to make. I don't do it every day, but three or four times a week. And I swim it in the very course where I plan to break the record; and in this I think I am different from most swimmers. I have seen them go into the tank they expect to perform in and take their work-outs every day, but they fool around and take it easy. They think that, even though they do not do their distance within two to five seconds of the time they want to make in the race, the inspiration of the fight will carry them through in the right time when the big day comes.

But I have found it does not work this way. I want to do the work over and over again, so

that I can tell by the feel of it whether I am making the time required. I become used to it, establish my groove, so to speak; so when it comes time to record my performance in competition, I am used to it and it is only a matter of habit to go through with it. I do this whether I'm trying for a record at fifty yards, a hundred, two hundred and twenty, or a quarter-mile.

There is no question about tearing down your reserve power by these trials when you are swimming sprints up to a quarter-mile. You are not in the water more than five or ten minutes doing this bit, and you certainly can regain the reserve during the remainder of the twenty-four hours. The first time you try doing the new time, of course, you will feel tired for a while afterward; the next time you will not feel so tired, and after that you will not notice it at all; so you have actually built up your reserve power by these time trials. And then you don't do them every day; only three to five times during the seven to ten days before the race.

There is a difference between training for sprints and training for long-distance grinds. When working for long-distance form, it is not

well to swim the entire distance every day either in your fastest time or in slow time. It is better to make the daily work-out a quarter- or a half-mile, swimming the entire distance of several miles only two or three times before the big day. The difference comes in that short sprints, lasting only a few minutes at most, do not tear down reserve power as do the long-distance grinds. In long-distance training you have to 'fatten up'; that is, store up strength and power.

I have had many a chuckle at the expense of people who advance the idea that some kind of contrivance which would enable them to catch more water with the hand would increase their swimming power. I have even seen one such idea, a web-fingered rubber glove, illustrated as a valuable new invention in a popular science magazine. It was represented to be a great aid to swimmers, but I haven't noticed that it has won any wide acceptance.

In the first place, there is nothing new in this idea, because I have heard that it was tested out years and years ago. There was no question that it enabled the swimmer to catch more

water. The trouble was that he caught more water than he could handle.

I have yet to see the swimmer endowed with the strength to handle efficiently all the leverage he can get with the bare hands. Of course, some swimmers do not catch enough water because they spread their fingers. To put webs between the fingers of such swimmers would give them more water, but it would spread the fingers to such an extent that they could not use all the leverage secured. The solution for them is to hold their fingers closer together, cupping the hand.

Again I want to stress the importance of practice in which the stroke is taken apart, developing the general physical power for the different parts of the stroke separately. In doing the leg thrash alone, lying chest down on the water with the hands on the polo ball and arms extended full length in front, you raise the head high and look straight ahead. This gives you the correct position for the stroke — chest hydroplaning, back arched, and feet low in the water where they are not in danger of breaking traction.

This is the best or only method I know for learning the extremely complicated secret of the leg thrash. It is one part of the stroke that cannot be learned by reading or hearing it described, and it is difficult if not impossible to illustrate it accurately in a land exercise. This practice throws a double burden on the legs for the time being, and thereby develops double power.

For the arm stroke practiced separately, the same is true, and even more valuable. With the feet held unnaturally high by being carried in an inflated tube, an added burden is thrown upon the arms, which must not only propel, but also keep the head and chest high in the water and the back arched. This exercise requires a great deal more work of the arms than does the actual stroke. It develops arm power in a way that no amount of swimming with the combined arm and leg stroke would provide.

It should teach some swimmers the secret that they have failed to reach second or third speed because they have not learned that the arms must do three fourths of the propelling work in the perfected American crawl stroke.

It teaches them what the power burden upon the arms should really be; that the arms should not work as a complement to the feet, but that the arms are paramount; the arms are first, the feet secondary, and the feet must be regulated in their thrashes to synchronize with the arms.

There are other important matters for the swimmer to keep in mind when out of the water if he would keep in good health and at all times at the peak of strength and power, and these deserve consideration at some length.

CHAPTER IX

REGULATING MY DIET

KEEPING the digestive system in order, it goes without saying, is of first importance in maintaining the strength and power of a swimmer. In fact, it is probably more important to the swimmer than to other kinds of athletes. One reason may be that the swimmer eats more; there is nothing like a good, snappy swim in cold water to stimulate an appetite.

Everybody appears to be interested in matters of diet nowadays. People diet to reduce weight and diet to put on weight. In this connection many people will be interested to know that swimming is an ideal exercise, either to take off weight or to put it on. Most swimmers put on weight, because the cool temperature of the water forces the body to acquire a layer of fat just under the skin to hold in the heat. It is this layer of fat which builds the curves and fills in the hollows.

If you go in the water much every day, lolling around and exercising very little, you will

put on weight of this kind. But if you work every minute you are in the water, swimming long distances at a fast pace, you will take off weight more quickly than by any other method. I have known long-distance swimmers to lose as much as ten pounds in a single race. Of course, they put it right back on again by hearty eating. The thing to do if you want to take off weight, and keep it off, is to curb the appetite which assails you after a long and vigorous swim.

However, the important thing for the championship swimmer is to regulate his diet, not with the view of putting on or taking off weight, but of keeping his strength and power at the maximum. Many interesting, and no doubt valuable, systems have been worked out.

One in particular that was tried out on me might prove interesting to others. Breaking world's records in swimming is a matter of being able to work harder, given relaxation and an efficient style of stroke, than anybody else can work, and of sustaining the harder work against fatigue.

Factors that make for fatigue are hidden, according to this system that I tried out. Two

men may look equally healthy on the exterior, but if one's body is secretly loaded with acids — although there may be nothing visibly wrong — when he comes to doing a little work he will find himself tiring easily, since fatigue is manifested by unneutralized acids. If the other's body is free of acids — even though there is nothing outwardly to distinguish him — he can make a strenuous effort and sustain it for a long period with little trouble from fatigue.

For fatigue is not primarily a matter of effort. A person may be very fatigued the first thing in the morning, after a long night's rest; or, he may be particularly fatigued on Monday, after having thoroughly rested for two days. The physiology of fatigue is, broadly, as follows: Physical effort produces body acids. The blood, which is always alkaline, neutralizes these acids, and the kidneys drain them off. An athlete running at top speed produces acid, within his body, at the rate of a dram every second. As long as the blood alkalinity is able to keep even and neutralize this amount of acid, the athlete can keep going. When the acids accumulate to a certain point — a state of affairs called acidosis — the

accumulation is made known to him as fatigue, and he has to stop.

Now I quote from a diet experiment at Battle Creek, as follows:

'Here in Johnny Weissmuller we had an example of perfect health, it would seem, and therefore of the maximum immunity to fatigue. His swimming records were apparently down about as fine as human capacity could bring them, so he hadn't broken a 300-meter record for some time, several years in fact. Nevertheless, when he was invited to Battle Creek, to help dedicate the beautiful new 120-foot pool in the Battle Creek Sanitarium Union, Johnny was looked over. Was there room for improvement in his already seemingly perfect physical condition?

'Whether there was or not, Johnny was put through a kind of training that was totally new to him. The seeming paradox of the thing was that the principles that were applied in the training of this physically perfect young athlete were the same principles that are applied, daily, to patients in the sanitarium.

'Nature does all healing or all training. The

only thing that doctors or trainers can do is to remove the fetters that are hindering Nature in her will to heal or to develop perfect efficiency. A body fettered with wrong living habits will not perform at its maximum efficiency any more than a wrongly constructed kite will fly. Yes, the same thing was done for Johnny as would have been done for an invalid; he was put on a régime of living habits that are the nearest possible to what is found to be Nature's wish. The idea was to let him avail himself of all there was in him, all that Nature endowed him with, in the matter of capacity to withstand effort without fatigue.

'First of all, Johnny was placed on a diet that, according to the best physiological knowledge, would energize him a maximum, acidify his tissues a minimum, and thus place at the command of his body its fullest capacity to neutralize the acids of exertion. A knowledge gathered from a hundred years of researches in all parts of the world was put into Johnny's diet. Here are some of the considerations that entered in:

'Foods are roughly divided into two classes, acid and alkaline, the latter foods called basic.

Basic foods should predominate in the diet, on account of the fact that the blood must always be alkaline. The body has troubles enough neutralizing its normally produced acids, without being burdened with more acid taken in as food.

'As to which foods are acid, and which alkaline or basic, the funny thing about this is that those foods commonly thought of as acid — like fruits and tomatoes — are really alkaline or basic in their chemical action on the body; whereas food like bread and cereals of all kinds — breakfast foods, for instance — are acid. Meat, fish, all flesh foods, also eggs, are highly acid. When you eat acid foods, you are, to a degree, eating fatigue. Johnny Weissmuller was therefore given no meat of any kind, and was given eggs very sparingly.

'Is it necessary to add that not a drop of tea or coffee (very highly acid) was given him? As Johnny's previous diet was described as "the average American," this was indeed a radical change for him. Neither coffee nor meat — and training for the maximum brain, heart, and muscular efficiency!

'Besides the basic character of the diet, it was laxative; that is, such foods were given to him as would fill his stomach and intestines without giving him too many calories or units of nourishment. It is *bulk* in the intestines that stimulates them to normal action. The penalty of light eating, or of concentrated eating, is intestinal inactivity, or constipation, a backing-up of the body poisons, and consequently a diffusing of them through the whole system. Foods that furnish a large amount of bulk, besides the necessary nutriment, are asparagus, cabbage, lettuce, parsnips, and spinach, besides fruit, such as apples, oranges, cantaloupe, and peaches.

'In addition to these bulk-furnishing and laxative foods, bran was supplied in generous quantities — as much as two tablespoons in his plate of soup — for its laxative qualities and also for its iron.

'Just as there are many different kinds of coal, and some will burn more efficiently and give more heat and power than others, so among the foods there are special ones that supply fuel with a lot of clinkers. The presence of clinkers

in the tissues is indicated by fatigue. So a man in training is after the foods that will give him fuel and energy without any hampering fatigue clinkers.

'Of the three elements in food, protein, fat, and carbohydrate, the protein is used for tissue repair. Little protein is needed in the diet, therefore. Protein foods are meat and fish, eggs, beans, and peas. The fat and carbohydrate foods are used as fuel, and are therefore energy foods; but of the two fuels, carbohydrate is the fuel that is the more quickly and efficiently available for heat and energy. That is, the process of using carbohydrate is an easier and quicker one than utilizing fat. For a swimmer, who wants a lot of energy quick, carbohydrate is, then, the ideal source of fuel or energy — carbohydrate unhampered by fat or protein. Carbohydrate foods are sweets, fruits, and starches. Of the sweets, ordinary cane sugar is found to be a little irritating to the tissues, and so malt sugar and malt honey were applied to Johnny Weissmuller. Also, for fruit-sugar, a generous amount of dates and raisins was supplied. For his last meal before the swim,

Johnny was given, therefore, not beefsteak "to make him strong," but fruits and sugars, in particular a large quantity of dates and raisins. That is, every possible effort was made to supply him with food that would give him the maximum fuel or energy and the minimum acid or fatigue.

'A basic, laxative, and energy-supplying diet was only half of the training, however. That kept down the incoming acids, or fatigue elements, to a minimum, but there was the drainage of fatigue poisons to be considered. Not only do the kidneys eliminate acids and body fatigues, but the colon gets rid of poisonous deleterious matter.

'There was still another feature in the programme of poison and fatigue elimination in the training of the young swimmer. This was the change brought about in the type of germs, or flora, permitted to inhabit his intestines — since one type of flora secretes a liquid that is a poison to the system and that causes undue fatigue; whereas another type of intestinal flora secretes a liquid that is harmless to the system and a liquid in which the harmful flora cannot

live. It is a case of which flora has the upper hand. That depends mainly on which flora receives enough of its own kind of nutriment. The good flora has to have fruits, sweets, and starches to survive on. The bad flora has to have protein — meats or fish, eggs, or shellfish. To give the good germs a chance, and to permit them to gain the ascendancy over the injurious germs, plenty of fruit is essential. In fact, it is sometimes necessary to go on an almost exclusively fruit diet, for a day or two, to give the good flora an opportunity to reproduce and gain the upper hand.

'The influence of fruits, sugars, and starches, in encouraging the growth of good or protective flora, so they may successfully cope with the enemy army of wild and poisonous flora, was well demonstrated during the Spanish War, when many of the soldiers were suffering from diarrhea and dysentery, and upon breaking into a peach orchard — supposed at the time to be an extremely dangerous thing to do in such a condition — found themselves suddenly cured of their ills.

'Greek athletes were much in the sun, and to

that fact modern science ascribes much of the extraordinary efficiency that they attained. Special rays of the sun act upon the bones and upon the blood and all the body processes. In some countries, where the amount of sunlight is meager anyway, and where the customs of the country are such as to keep people much indoors in unventilated and unsunned houses, terrible diseases afflict the inhabitants in consequence, and yet these same diseases yield at once to the magic of simple sunlight.

'Most of the so-called degenerative diseases, those most prevalent in middle and late life, are found to be benefited by simply baking the patient in the sun. What makes for healing the sick makes for the increased efficiency of the well. Thus, sunlight promotes the neutralization of those acids that are constantly forming, and that show up as fatigue. So Johnny was baked in the sunlight. It happened to be a cold, cloudy time of the year, but artificial sunlight baths were available at the sanitarium, by which he obtained even more intense and concentrated rays than the outdoors could give him.

'Thus was Johnny Weissmuller, fit though he seemed to be, made fitter.

'It was in Philadelphia in 1922 that Johnny made his world's record for three hundred meters in three minutes, thirty-five and one fifth seconds. That was more than five years ago when he was only seventeen years old. Five years at this time of life are mostly strenuous ones, and after 1922 he had never found himself quite so fit for that particular swimming distance. His stroke is the crawl, of course, with a six-beat flutter. In the one hundred and twenty-foot tank, in which he was to do his middle-distance swim, he would be handicapped by lack of turns. The world record had been made in a seventy-five-foot tank, and in the turns and push-offs an advantage of about three seconds is gained. In this longer tank of the Battle Creek Sanitarium Union Gymnasium, he would have those three seconds to make up before he could even equal his old record.

'Did he make them up? He did, and more. He subtracted one and three fifths seconds from the record. In other words, his own world record for three hundred meters that had

formerly been placed at three minutes, thirty-five and one fifth seconds was now broken by himself, and placed, instead, at three minutes, thirty-three and three fifths seconds, a new challenge to the athletic world.'

That ought to be about enough to describe the system I tried out at Battle Creek. I offer it, not because I have adopted it as a whole, but in the hope that some swimmer who is worried about his diet may find some ideas therein with which to experiment. For my part, I am content with Bachrach's system, because it takes less thought and trouble, and so far it has worked pretty well for me. Its simplicity is its appealing virtue.

Bachrach says that swimmers attain perfect athletic condition with practically no disturbance of their normal methods of life. There is no rigid or freakish diet prescribed for the swimmer who is working up to record-breaking form. He advises a diversified diet, with emphasis on greens, vegetables, and fruit.

Much meat, he says, if not balanced by greens, vegetables, and fruit, tends to bind and retards normal elimination. This is something

that I was a long time in learning. No strict régime was required of me during the racing season.

There are several reasons for this. While athletes in nearly every other sport are required to observe rigid training rules, as to diet, swimmers are permitted as a rule to follow their fancies. This has an important psychological effect.

Self-denial puts the track athlete, the football or basketball player, under strain. It makes him irritable. He becomes a better athlete and reaches the height of his power by loyalty and religious observance of the requirements. But because of its irksomeness, he is looking forward to the time when he can throw off the regulations and 'break training' — have a good time. The fact that his seasons of active competition are short is therefore fortunate.

On the other hand, swimming is an all-the-year-around racing sport. To ask the swimmer to keep up a continuous twelve-month régime of self-denial would be too much. It is not necessary, and there is a good reason. These other sports tear down body tissue. Swimming, with

the exception of short spurts of great speed and very long distance grind, builds up body tissue. The swimmer, therefore, must have all the growing foods in his diet.

The psychology of the pleasing diet for the racing swimmer is that he enjoys his work and can ask nothing better than that his training continue indefinitely without a break. Any break would be less pleasant than continued training.

There is only one thing I try to avoid in my diet. On the face of it, it seems unnecessary to state it, but here it is: I avoid anything that does not agree with me. Does anybody eat anything that doesn't agree with him? Strange though it may seem, almost everybody does. You will realize the truth of this when you stop to think about it.

You know that certain things upset your system, and yet you keep on eating them because you like the taste, or for the pleasure of eating. I must have my digestive apparatus in splendid order at all times, and therefore I employ the will power necessary to thrust away any foods that upset it.

It is not wise to keep young swimmers away from sugars, starches, and other fat-building foods, because young swimmers are active enough to burn them up. They need these foods in their growing bodies. Sugars and starches are good for older people to avoid because they are not active enough to use them up, and fat, therefore, accumulates.

For my part I eat whatever I want, don't want anything that doesn't agree with me, and I gain about five pounds a year regularly. But by keeping in competitive trim I put this weight on in a way that cannot be noticed; I still look thin in a swimming suit.

Another thing that a swimmer needs to keep in shape is plenty of sleep. As a nerve-builder there is nothing like sleep, and a swimmer needs more of it than other athletes. Probably that explains why you get sleepy, after your appetite is appeased, following an invigorating swim. The swimmer should get at least eight hours of sleep every night, and a nap an hour or two before a fast race is often a big help.

In all of these things — daily practice, regu-

lation of the diet, and sleep — regularity is the great thing. Regularity in right living keeps the swimmer at his maximum in strength, power, and health.

CHAPTER X

FIRST PRINCIPLES OF BREATH CONTROL

Learning to swim differs in its problems according to the age of the pupil. Boys need very little instruction as far as becoming at home in the water is concerned. They can pick up the elementary principles and the simpler strokes, if they have access to the water.

With older people it is different. They need a lot of instruction and patient coaching. They have built up too many cautions. Where the boy is adventurous, ready to experiment with anything, the older person is tied up by fear.

At summer camps I have found it a waste of time to give the boys long talks on breath control and handling the body in the water. They are impatient to plunge in. It is best to give them a little instruction — as little as possible — and then get into the water with them.

One of the short cuts to teaching boys to swim is to put them to floating on their backs. This works like magic, expecially for fat boys. They learn immediately that the water will

THREE MOVIE SHOTS SHOWING INHALING

Top picture shows my head being snapped to the left, as on a pivot, for the inhale as the left arm finishes its stroke. Middle picture shows me inhaling through the mouth as my left arm comes up in recovery. Bottom picture shows my head being turned back into the water as the left arm comes forward in recovery.

support the body, and they are ready at once to learn something more.

Of course, my experience with instruction for beginners is fairly limited, owing to the fact that my career up to the present has been in the amateur field, and amateurs are forbidden to engage in teaching for pay. However, I have taught various friends and acquaintances here and there who have asked me for hints, naturally taking no compensation.

While I have not done much teaching, I have listened to my coach and others giving lessons, times without number. Bachrach has taught thousands of beginners in his twenty-five years or more of devotion to the game, as well as developed championship-winning stars. So I think it may be permissible to borrow from him some hints on initiating beginners.

With older pupils he usually begins with a brief lecture on the fundamentals of breath control. This is logical, because it is the most important thing to learn, yet too many coaches, I think, yield to the impatience of the pupil to get into action, to do something with his arms and legs.

Large classes of beginners must of necessity be taught in shallow water, where they can look out for themselves. The individual, however, may be initiated even in deep water from the edge of a tank or wharf. Bachrach, who specializes on individual instruction, has evolved an interesting method of teaching body buoyancy in deep water. He maneuvers the pupil at the end of a stout bamboo pole. He keeps the swimmer close to the rail, to be grasped at any time. Also, he does not decoy the pupil far from the ladder. Instructing the beginner to grasp the pole, Bachrach has him push the pole out at arm's length. The pupil thus floats easily out from the ladder with his feet trailing, while Bachrach talks like this:

'Hold your breath. Keep your head up, your eyes on the ceiling. Do not move your legs. Keep the pole away from you at arm's length. Ease your grip on the pole — don't hold it so tight. Blow out your breath, inhale and hold your breath. Do not draw the pole toward you — keep it at arm's length. Head up — don't kick with your feet.'

Bachrach keeps up this line of chatter,

stopping the swimmer now and then, making him recite every point of the instruction, until he begins to show signs of discipline. Then he is encouraged to let go of the pole with one hand, then to change hands. Thus the coach tows him up and down the tank for a distance of about ten feet, going through all motions slowly.

Next comes an important step. Instructing the swimmer to take a deep breath and hold it, he leads him to let go of the pole with one hand, then with both hands, slowly and easily. Any sudden movements are instantly penalized by a halt in the instruction while the swimmer is given a rousing 'bawling out.' If he gasps for breath, he is 'bawled out' for that also.

When he lets go of the pole with both hands slowly and without a sign of panic, holds his breath, and just rests there on the water moving arms and legs gently, Bachrach shouts for joy.

'What have you done?' he cries.

'I held my breath,' the swimmer states.

'What of that?'

'I didn't sink.'

'Hooray! Eldorado! Eureka!' shouts Bachrach, calling upon everybody in the bath to

come, gather around, witness, and marvel; for here is another swimmer who has discovered for himself the most important thing to know in the water.

The body floats! Without effort! All you have to do is hold the breath and refrain from movement! The body floats!

It transcends the value of anything else a coach can teach — that the human body cannot sink in the water providing the breath is held, unless movements are made to pull it down, or unless head or hands are raised out of the water to force it down.

This method of teaching body buoyancy is not so well adapted to classes of large numbers. It is one point in which the individual type of instruction has a decided advantage over mass drill. However, the idea may be altered to the extent of turning the exercise over to the back. It is easy to teach a group, lined up in shallow water, how to float.

A person ignorant of the principles of navigation may learn to float without much trouble. Select a place where the water is waist deep. Take a long breath, almost completely filling

the lungs, and hold it. Extend the arms sideways, cross fashion, turn the palms down on the water, and lean slowly backward.

When the head is well back in the water, push off gently from the bottom and raise the legs to the horizontal position, so that the whole body rests flat upon the surface. Imagine that you are lying stretched out, completely relaxed, upon a bed. It is the softest bed you ever reclined upon.

If your push-off from the bottom was both upward and backward, a slight momentum will be imparted to the body, adding to the buoyancy.

Once off in this manner you relax every muscle, except that you are still holding your breath. You hold it until the bobbing incident upon dropping backward ceases.

Then start breathing again. Perform the exhale and inhale very quickly, then hold the breath for a brief period. This makes the deflated period, when the body will be susceptible to sinking, too short for the decline to get under way. Holding the breath for a period recovers any altitude you may lose in the respiration

process. Thus the inflated period is always about four or five times longer than the deflated period.

Those having small bones, small muscles, and lots of fat will be able to learn floating very quickly, possibly at the first trial if they follow instructions.

It is important not to become frightened if water washes over the mouth as you lie stretched out. Water in the mouth should not bother anybody, as far as breathing is concerned. You drink a gallon of it daily, through the mouth. When water enters the mouth, you can do one of three things — swallow it, hold it, or expel it, just as you like. In the mean time, hold your breath. As soon as the body rectifies its position, your mouth will come clear and remain above the surface.

Those having large bones, large muscles, or long bodies, marked by an absence of fat, may encounter a tendency for the feet to lower in the water.

This tendency may be equalized somewhat by moving the hands slowly forward in the water until they extend in advance of the head.

Also, air may be sucked lower into the lungs, thus shifting the center of buoyancy in a manner to lift the legs. If these two maneuvers are not enough, the hands and feet may be employed in gentle, undulating paddling to support the body.

Some coaches advocate a still further adjustment. They say it is beneficial to bend the knees, separating them sidewise and bringing the feet together up toward the crotch. Some swimmers may be able to benefit from this reduction in the leverage of the legs.

After the body buoyancy exercises, you may learn the principles of breath control. It may be pointed out that the fear which makes it hard for some people to learn to swim, the fear of strangulation, is overcome by learning how to avoid this unpleasant experience.

Bachrach has a very good illustration of how our lungs work, bringing out the value of this understanding in learning the method of breathing which insures against strangulation.

'Under normal conditions,' he states, 'on dry land our breathing apparatus works automatically. It requires no thought or direction on

our part. The process is like that of a soft rubber ball with a hole in it — when squeezed, the air rushes out through the hole. When you release the ball, it does not fill up by sucking air in. The outside pressure of air forces the air in to fill the empty space, for "Nature abhors a vacuum."

'It is the same with our lungs. Contrary to belief, we do not suck air through our noses. All we actually do is to force air out of the lungs; air pressure takes care of refilling them. The air is forced out by the action of the diaphragm, a broad, flat muscle situated at the base of the lungs. When the diaphragm relaxes, air rushes in through the nose to fill the empty space created by the relaxation.

'On land in our familiar environment this diaphragm works unconsciously. Upon entering the water, however, you come to grips with a strange element. You find yourself in an abnormal situation. Fear enters the mind, preventing normal, unconscious functioning of brain and body.

'You must then force the diaphragm to work. To know that you must regulate your breathing

by voluntary effort is the first thing. How to do it is the next thing.'

The instinctive thing for a beginner to do is to hold his breath. As soon as he learns to overcome this, half his fight is won, and he is ready for the finer points of swimming.

CHAPTER XI

IMPROVING BREATH CONTROL

When a swimmer learns without instruction to become at home in the water, simply through years of inhabiting the fluid, he is not likely to master the secrets of breath control except by accidental discovery. Time and devotion to the sport may teach a boy everything but that.

How progress in swimming is sometimes hindered by lack of a thorough mastery of breath control, even after years of boyhood experimentation, is illustrated by the experience told of by C. A. Bush, my collaborator.

'For years,' said Bush, 'I had been swimming in creeks, rivers, Y.M.C.A. pools, and at beaches, but had never developed the power to navigate more than two or three lengths of the sixty-foot pool without becoming exhausted and breathless. No matter how much effort and determination I put into it, I could not get beyond this limit. I swam a sort of trudgeon stroke, and turned my face into the water as I made the left arm pull, but I did not exhale under water.

I held my breath until my face came into the air, and then I exhaled quickly, and then inhaled quickly.

'One day without forethought, I began to exhale before my face came clear, though I still held my breath for a little time. This advancing of the exhaling, starting it under water and finishing it above, gave me such relief that I was able to travel nine lengths of the tank before tiring. Next time I made eighteen, then thirty-three, and after that I could swim almost indefinitely. This development in power came very suddenly, after years of frustrated effort, simply because I had stumbled upon an improved method of breath control. But it was not yet the full development.

'My next big advance in technique came when Coach Bachrach, watching for my exhale bubbles, discovered that I held my breath for the first half of the period my face was in the water.

'"Why do you inflict that punishment upon yourself, holding your breath until you are ready to come up for more air?" inquired Bachrach.

'"Because I need my wind for the final snort

out of water to clear my nose of any drops that might trickle down to my windpipe," I answered.

'"I understand that part of it," said Bachrach. "But this is what you should do. Keep a flow of air either going or coming at all times, the same as you do on land. Don't blow it out fast so it will be all gone. Let it out slow. Let the exhale be a 'slow-motion movie,' taking four or five times longer than the inhale. The inhale is a quick bite, a gulp through a wide-open mouth. Then at once start the slow exhale, and keep just enough for the final snort."

'Although I tried his plan a few times, my habit was a strong one and hard to break. However, I kept at it and finally fell into it naturally. Then came my third big advance in swimming ease. Where a mile a day had exhausted me completely, I began to do a mile and a half a day with greater ease.'

This experience serves to show the importance of keeping the beginner on the fundamentals of breath control, going into it in great detail and sticking to the elementary exercises until the art is so thoroughly mastered as to become second nature.

Another reason for prolonging these exercises through several lessons is that the beginner's nasal passages need to become accustomed to water. The walls of these passages are very tender. The irritation caused to these membranes often takes the pupil's mind off of his instruction and may even discourage him, unconsciously, from continuing with the course. Therefore, it is essential that these passages become thoroughly seasoned by the water before any advanced instruction is attempted. 'Home work' assignments in breath-control exercises with the swimmer immersing the face in a bathtub, basin, or washbowl, will hasten this seasoning process.

To put into practice these theories of breath control, it is advisable to have a little preliminary drill on dry land. Bachrach sets his pupil down in a comfortable chair.

'Open your mouth,' says Bachrach, 'by relaxing your lower jaw enough to say "Ah-ah!" or take a bite out of a big chocolate cake at a picnic.

'Then relax your diaphragm. As you do this, the air pressure forces the air into your lungs

through your mouth. Do not stuff your lungs. Take whatever air the outside pressure puts in naturally. Just take a quick bite.

'Your lungs are now normally filled. Shut your mouth, compress your lips, and order your diaphragm to squeeze the air out of your lungs through your compressed lips, just as the hand would squeeze the air out of the hole in a soft rubber ball. To get the proper shape to the mouth, just imagine you are playing a cornet.

'Do not blow out all your air. Keep a little. If you inhale and exhale more than normally in this exercise, you will get more oxygen than your lungs are accustomed to. This may make you light-headed. If you get dizzy while doing this exercise, you will know why.

'Natural breathing is somewhere between sixteen and twenty-two times a minute. Try to do this unnatural exercise at the natural pace. The mouth is not opened wide for the purpose of stuffing your lungs, but to enable you to get your air easily and quickly and to decrease suction. In this exercise the mouth should snap open at the finish of the exhalation and take a quick bite.

'Now that you have gained some idea of voluntary breathing, let's try to put it into practice. Take a breath, fill your lungs, shut your mouth, and hold your breath for a few seconds. Now, with extra compression on your lips, give a forcible, explosive blow to empty your lungs. Immediately open your mouth and let the air run into your lungs. Follow this up by breathing very easily and normally, all with your mouth, of course, until you get back to normal.'

There are two other methods of practicing breath control. One is the perpendicular breathing practice, and the other is the horizontal. In the first, you get into the water about waist high and raise your hands overhead. The counts are:

1. Breathe in the air through wide-open mouth.

2. Bend the knees and sink, submerging the head, and blowing out the air through the nose.

3. When the air is about all out; straighten the knees and rise slowly to the surface.

Keep the hands overhead throughout this process. Take one second to breathe in and about ten seconds to breathe out.

Too much force used in blowing the air out may close the nasal passage; use the exact, right amount of force, and this the most important of all details — correct breathing -- may be learned by a class of two hundred in a few minutes. To form the habit of correct breathing in swimming, do this exercise a score of times.

In the horizontal method you get into very shallow water. Place your hands on the bottom. Rest on your hands and permit the body to assume the horizontal position. Lie as low as possible in the water, permitting the body to relax.

Take a very deep breath in through the mouth by opening the mouth with a jerk, taking in an enormous amount of air with a gulp, and then closing the mouth with a snap. After holding the air for a moment or so, allow it to flow out through the nose in a steady stream. Keep the mouth closed and relax while the process is going on, especially while exhaling. Repeat a few times.

Remaining in the same position, take the left hand off the bottom and place the left elbow

WIDE OPENING INHALE

EXHALING UNDER WATER

THE FULL EXTENDED POSITION FROM WHICH THE STROKE STARTS

The light line in each cut indicates the surface of the water

there. Recline lightly on the left side, having the left shoulder and left ear in the water; roll the top of the head into the water. Roll the back of the head into the water and incline the chin and face up.

Now breathe in through the mouth, then turn the face down by a half-rotary movement of the neck and a slight roll of the body. Turn the face into the water and exhale through the nose, slowly expelling all the air, making a steady stream of bubbles under water.

Make the exhaling complete. Sternly suppress the tendency to raise the head and shoulders out of the water on the completion of the exhaling. Hold the shoulders down and roll the face up out of the water again, keeping the back of the head in the water, and open the mouth for another deep inhale.

Another way to learn swimming respiration: the beginner should stand in the shallow water, take a good breath, then duck the face and let the air ooze out by degrees through the nostrils. You may follow the same process in a basin or tub of water at home.

By still another method you stand in the wa-

ter reaching about to the arm pits. Place the hands on the hips. Inhale deeply through the mouth. After inhalation, close the mouth naturally. Do not try to squeeze the lips together tightly.

Now squat slowly, keeping the feet on the bottom, body erect, bending at knees and waist, until the head is completely submerged.

As soon as the head is fully under water, begin to rise slowly to the starting position, exhaling through the mouth or nose as you arise.

Open the mouth wide after coming to the surface each time, because, if you hold the lips tightly together as you inhale, you will be more likely to suck water into your mouth.

At this stage, closely related to the breath-control exercises, comes the matter of opening the eyes under water as a method of eliminating fear and making the beginner feel at home. This properly comes before teaching the swimming position.

Clear water will at first cause a slight smarting of both the nasal passages and the inner side of the eyelids, but it is perfectly harmless, and

one soon learns not to notice this slight discomfort.

Do not try to bat your eyes on the surface of the water. Plunge your face well into the water, then open the eyes and keep them open. In good light the swimmer can see well enough under water to guide his course. No one has mastered the aquatic element until he has learned to see as fishes do.

There is an important psychological value to this matter of opening the eyes in the water. When your eyes are open, you see. Sight is light and knowledge. When your eyes are closed, you are blind. Blindness is darkness and ignorance. Your eyes being opened or closed in the water makes as much difference as going into a haunted house in the darkness of night and going into the same house in the sunlight of day.

CHAPTER XII

ADVANCING TO THE SWIMMING POSITION

Now the pupil who has been through some of the exercises previously described has had his head under water more times than ever before in his life. He has learned that his body is buoyant as he maintains the right position, as long as he relaxes and refrains from struggling, and as long as he keeps his lungs fully inflated.

The prolonged preliminary period is well rounded-out by a variety of exercises which train the beginner in manipulating his body in the water. These exercises have nothing to do with suggesting any definite style of propelling stroke.

The beginner needs to know, at this stage, how to lie down and how to get up in the water, first while holding to support, and then without any aid, and finally how to assume an elementary swimming position.

He has learned breath control, or consciously directed breathing, as practiced by the best swimmers. He has learned to open his eyes

under water, and to cope with water in his nose or throat without strangling. His fear of water is greatly lessened, and he is in the proper psychological mood to learn more about swimming.

The next step places the swimmer in the water standing in a depth about chest high. The beginner is instructed to hold to the railing, rope, or other support.

Place your face in the water, leaning a little from your waist to accomplish this, open your eyes and hold your breath. Let your body settle a little in the water so that the body will be partially floating. Then let your feet leave the bottom and float out behind you.

All this time you are holding to the railing to keep from floating away. Now try to relax your muscles and really give yourself over to the water. It makes no difference whether your legs float high or low, just so long as your legs float off of the bottom. Don't make any effort to bring the legs high.

Now you want to get up. The proper way to get up is to bring the legs down to the starting position by bending at the waist, a little at the

knee, and very, very slowly bring the legs forward until they are directly beneath you at right angles to your upper body. Then, and only then, lift your head out of the water and expel the air from your lungs, blow and relax.

The value in this particular stunt lies in the fact that the slower you bring the legs forward, the more mental discipline you are acquiring. The natural tendency of the beginner is to bring the legs forward as rapidly as possible, to shorten the time that the face is under the water.

You are not improving until you bring forward your legs very, very slowly. You see, you cannot get up in the water unless you bring your legs down to the bottom. This cannot be accomplished violently when you are not holding on to something. All movements in the water must be made slowly. It takes time even for a stone to sink in the water. Still, beginners expect to get up instantly.

Next time you try the stunt, you must concentrate your attention upon relaxing in the water and upon accentuating the slowness with which you bring the legs down under you to regain your standing position.

After that, loosen up the hold of your hands on the railing so that the fingers are only touching it and are being used only as an anchor and not to support the body. Let the water support the body. Remember you must bring your legs forward slowly and get up slowly.

Resuming the last exercise, lie face down in waist-deep water. Let the legs float out behind, bring the legs forward very, very slowly. After bringing the legs forward and before you lift your head up out of the water, let both hands slip off of the railing or rope and press down on the water with the palms of the hands while your hands are separated, pressing just down and outward.

Then lift the head up. Remember not to press down with your hands until you have brought your legs forward directly beneath your body and you are ready to stand up. After you have repeated this a number of times, change your position so that you will be standing alongside the railing, so that you can reach it if necessary. This is just for the sake of security.

Without touching anything, place your hands

forward in the water very near the surface, palms down. Then bend forward from your waist, place your face in the water, eyes open, and gradually lean forward until your feet leave the bottom. Don't fall into the water, but gradually lean forward, so that your body goes into the water by degrees.

Then your legs will float. Many beginners get panicky because they have a feeling that their legs are higher than the head and that the head is going down toward the bottom. As a result, they scramble to safety. That is why you should stand alongside the railing or rope so that you can easily reach it if you have a little panic.

If you experience this panicky sensation, you will have to reason with yourself along the following lines:

If you lay a board in the water, one end won't float higher than the other. Just make up your mind to believe that, if your lungs are filled with air, that part of your body will always float as high or higher than any other part.

Simply steel yourself to lie there in the water, face down, your eyes open, your mind ac-

tive, long enough to find out that your legs will not rise higher than your head, or even as high. While you lie there, relax. Relax again and again. Let go of your muscles.

Now comes the part that means everything to you. Can you bring those legs forward as you were told in the last lesson, very, very, very slowly, underneath your body? If you can, Eureka! The gold is discovered. Because then all you have to do is to press the palms of your hands down on the water and stand up.

Relaxation and observance of the buoyancy of the body are emphasized in another exercise for lying down and getting up in the water without holding to anything.

Stand in water reaching to the arm pits. Stretch arms forward relaxed, letting them rest on the water. Inhale deeply through the mouth; put your face in the water and push easily off the bottom and slightly forward, keeping your face in the water.

You are now stretched at full length on the surface of the water. Relax your entire body, making absolutely no effort to support yourself.

To regain the standing position, raise the

head and pull both arms down, at the same time bringing the knees up to the stomach. This will cause the feet to sink to the bottom and enable you to stand up again.

Practice this exercise until you feel perfectly at home in the water.

Here's another method: Extend arms to the side, body in squat position in shallow water, shoulders under water, feet together. Take a deep breath and hold it, keep the chin to the chest, bend the head forward until the face is in the water. Glide slowly forward, transferring the support of the body slowly from the feet, on the bottom, to the floating power of the lungs. Do not jump or kick the feet, but simply glide forward slowly, straightening the hips and knees until the body is in line from the head to the toes, arms to the side extended.

Make the change very slowly without being in a hurry to get up and take a new breath. In most cases the toes will remain on the bottom, although the body is supported by the lungs. Only a very few people will find that their feet rise to the water surface. Have the lungs very full and hold for ten or fifteen seconds.

After this experiment with the horizontal position, the push-off from the side of the tank may be tried with the body in the narrowed-down position. This position is the same as that described above except that the arms are extended together overhead and the thumbs may be locked together to keep the hands from drifting apart.

Place your back to the wall at one side of the pool. Lower the shoulders to water level, keeping close to the wall. Take a deep inhale and then drop the face between the arms which are extended on the surface of the water. At the same time jump both feet up to the wall and give the wall a hard shove, driving the body across the pool without other motion.

Keep the eyes open under the water. This will enable you to observe your progress and also divert the mind, obviating fear.

This exercise teaches you the fundamental swimming position, with the body narrowed down to its least displacement, offering the minimum of resistance to progress in the water. All speed-propelling strokes must be built upon this position with as little variation from it as

possible, because the more you vary from it, the greater resistance you encounter.

Having executed these exercises, you should now be at home in the water. You have learned to relax. You cannot be afraid of the water now where it is only waist deep. You are able to see in the water. You are able to lie down in the water and get up whenever you want to.

Now is the time to take stock of your thoughts and emotions. You are not afraid of smothering or strangling as you lie there in the water. You are not afraid of sinking to the bottom, and you have proved to your own satisfaction that the water will float your body and that it is not necessary for you to spend any physical effort to stay on the surface.

Your fear of the water being largely overcome, your mind is now in a receptive mood to learn something about propelling your body, which by this time you have learned is supported by the water.

Lie down, face in the water, eyes open, relax your muscles, start paddling with your arms and legs alternating, one at a time, the same as you have seen dogs swim. Be sure to remember

to try to relax. Just do three or four strokes, so that you will have time to get up before you get out of breath.

Do not go in for this paddling too strenuously at first. If you get too interested in covering distance in the early stages, the first thing you know you will discover you have not enough breath left to take you through the process of standing up in the correct manner, which should take a little time to accomplish. No one can get up instantly. You cannot get up until your legs sink.

Try the paddling again, but try to remember not to work hard and be sure to try to relax. Do not swim too far.

After you have learned to control your arms and legs to a reasonable degree, you are ready for the next step. While you are swimming, try to raise your head out of the water by degrees, not all of a sudden. At the same time the legs should be sinking to a lower depth.

There is a reason why your legs should sink when your head comes up out of the water. It is this: you cannot have your legs and head both on the surface. Either your legs or your

head must be up. You want your head up because you may want to breathe. You do not breathe with your legs, so there is no necessity for having them up.

If you insist upon keeping your legs up when your head is up, your back and neck will become strained and you will experience quite a bit of suffering. The strain on the back causes a distress that limits the beginner's thoughts and efforts. When your legs are down, your back relaxes. The thing for you to do is to learn to want your feet down when your head is up.

Don't think that your legs ought to be on the bottom. The body ought to be at an angle of twenty to twenty-five degrees. The legs continue to paddle at the lower level. You may feel that your legs cannot work at this lower level, but you must make them work. Don't be particular how you kick, but just kick.

Be sure you do not let your arms come above the surface of the water. Shoot your hands forward under the surface in a stabbing motion. To bring the arms out of the water at this time would result in splashing. Your head being out

of the water, the splashing would interfere with your breathing and your vision.

Keep the head up, but not too high. All that is necessary is to keep the mouth clear for breathing. Do not breathe through the nose at all in this beginner's stroke. Inhale in short gulps through the mouth. Exhale through the mouth. If any water enters the mouth, expel it or swallow it.

Breathe at intervals, whenever you feel it necessary, say, every three or four seconds. Remember you can only get in as much as you blow out.

There is a chance for relaxation in this stroke. Do not go about it too violently. Take it easy and do not get excited. Remember that the secret of swimming is not muscle, but relaxation.

CHAPTER XIII

LEARNING THE ELEMENTARY CRAWL STROKE

HAVING learned body buoyancy, breath control, and the manipulation of the body in the water in the swimming position, you may now be ready to try the elementary crawl stroke.

First you do the plunge, in which the body assumes the fundamental position for the crawl stroke. Stand in water waist deep with your back to the upright, side of the tank, pier, or whatever you have chosen. Extend your arms overhead. Place one foot against the wall knee high. Bend over at the waist until your head and body are submerged.

From this position you take a good breath and push vigorously away from the wall with your foot. Let your legs trail along close together. You will glide along the surface in this extended position, face down, for a short distance.

Your arms should be held straight out in front near the surface of the water. Arch your back up. Don't raise your head to see if you are

moving or to take a breath. You can hold your breath easily for the extent of this glide. If you will keep your eyes open, it will give you confidence and a sense of mastery of your environment. If your body inclines to roll, spread the legs to balance yourself. Relax — don't hold your body tense.

Now you are ready to stand up. Press down with your hands, raise your head out of the water and bring up your knees, then take a step as in walking. Your foot will find the bottom and you will stand up. Don't hurry this effort to gain your feet; take it easy. The slower you do it the better; that shows you are relaxed and confident, and you are making progress.

Now try the same exercise over again and again. If you are timid about trying this alone, have a friend stand by for the first few times. He can stand a few feet in front of you while you plunge at him as your objective. Have him get a little farther away each time, to increase the distance of your plunge. If you have difficulty getting to your feet at the end of the plunge, he can give you a hand.

After trying this a few times, you realize that

the body is buoyant enough to float on the surface of the water. You find that the body is lighter than the water it displaces. While some people float high and others float low in the water, in either case the upper part of the body is above the surface.

Next you try the same exercise, but use the arms to extend the length of the plunge. Stroke first with the right arm, then with the left, keeping your feet close together and your face down in the water. The movement is continuous, the arms being brought out of the water at the end of the stroke and carried forward out of the water. The arms are always equidistant.

One arm makes its pull while the other is being brought forward out of the water in recovery. To get your arms out of the water, it is necessary to roll the body up on the side on which you are making the recovery. Then you roll to the other side to clear the other arm.

It is important to watch that you bring your arms down into the water, not sweeping them sidewise, and that in recovery you get your arms out of the water. You may practice this revolution of the arms out of the water until you

can do it mechanically. Remember that a good long easy stroke from front to back is better than a short jerky one, and keep your body and legs relaxed.

You will find that with the use of the arms you will cover a good distance in this plunge without the use of the feet. The feet may sink a little in the water, but that should not bother you. It will make it easier when you are ready to stand up. Practice this a number of times until you feel that you have mastered it. The more you practice it before you take up the leg stroke, the better.

Next, try using the legs alone. Keep the arms extended in front of you, palms down, and face down in the water. Now flutter your legs, beating straight up and down. Don't make this a wide beat; make it narrow, the feet never being more than a foot apart at the widest stage of the thrash. If you get a relaxed, whiplash motion into this leg thrash, you will find that you make good progress. Keep your back arched up. This will prevent your feet from coming too high in the water and breaking the surface.

After practicing the leg thrash alone for a

while, you may be ready to combine the arm and leg motions. First plunge and start thrashing your legs, then add the arm action. Remember, the arms are more important, and you should let the legs coördinate naturally, without conscious direction, with the arms. The proper coordination will come with practice.

With this mastered, the next step is to learn to inhale by turning the face to the side. In the chapters on breath control you have learned to exhale under water through the nose, and inhale, when the face is turned to the side, through the mouth.

Now, then, using your arms and legs in the combined action, you turn your face to the side when the left arm completes its stroke and comes out of the water for recovery. As the left arm goes forward, your face naturally turns back into the water and you start your exhale through the nose immediately. You expel your air slowly, however, so that you are exhaling throughout the entire stroke and recovery of the right arm, and are still exhaling as your face again comes to the side position.

It is important to breathe naturally, taking

no more air than you need on the inhale, and saving a little for the finish of the exhale as your face turns to the side. You will not have to slow up your stroke to get time to inhale. Inhaling is almost instantaneous and automatic; all you have to do is to open the mouth wide and the air rushes in. Exhaling is a voluntary or forced effort; if you have really emptied your lungs on the exhale, inhaling is merely opening the mouth wide, and it takes only an instant to get all the air you need. If you have to gasp for air, that shows that you have failed in your exhale and are trying to stuff more air into lungs already full.

If breathing troubles you, go back to the chapters on breath control and repeat the exercises given there.

With breath control mastered and the elementary movements of the arms and legs in the crawl stroke learned, your progress from now on is merely a matter of practice. Go into the water daily and stay as long as you like.

In this chapter I have not gone into the finer points of crawl-stroke sprinting, as they were fully detailed in the first part of the book.

CHAPTER XIV

AS FAR BACK AS I CAN REMEMBER

My birthplace was Winbar, Pennsylvania, but I do not remember living in any place but Chicago. My parents are German-Austrians from Vienna. I resemble my father, Peter Weissmuller, who has always been fairly tall and slender, but was not so tall or so heavy as I have grown. Both my father and my mother liked the water, but they never did much swimming.

My first recollection of going into the water is when I was about eight or nine years old. My mother took Peter and me over to the 'Baby Beach,' better known as Fullerton Beach, in Lincoln Park, which is on the shore of Lake Michigan, a mile or two north of the central business section of Chicago.

Mother bought us a pair of water wings, and taking turns with these under our arms, we waded out into the water and splashed around as did the other children. This beach is very shallow, on the west side of a protected bay or

lagoon that reaches in from the lake. The water is always warm and smooth here.

We spent our 'tadpole' days here. We got to like the water so well that we were in it all the time. As we got older, we came alone or with other boys and made this beach our 'hangout.'

As we got accustomed to this, we grew bolder and thought we'd like to try the lake itself; so we strayed over to the lake shore to a section called 'The Rocks.' There is a broken-down breakwater here with great boulders lying around. It is located just east of the Lincoln Park golf course, a little to the north of Fullerton Beach.

The water was deep and cold here right up to the rocks, and the water was often rough, as it is right out in the open with the rollers sweeping in off Lake Michigan and dashing against the rocks. We knew enough about swimming by that time to plunge right into deep water and keep going. Here we learned to dive off of the rocks and do lots of stunts that were impossible at a shallow beach, and I shall never forget the great times we had playing around 'The Rocks.'

We entered a lot of the boys' races held under the supervision of Lincoln Park officials. One of these officials that I remember well is George T. Donoghue, who is now superintendent of the South Parks, and this year became chairman of the athletic committee of the Illinois Athletic Club.

At this time I was going to Saint Michael's grammar school in our neighborhood. I used to go with a couple of my school chums after school to the Stanton Park Pool. This is a public tank on the northwest side. My chums in those days were 'Hooks' Miller and 'Hank' Miller. It was 'Hooks,' a much better swimmer than I was at that time, who eventually was to introduce me to the Illinois Athletic Club.

Well, we joined the swimming team at the Stanton Park Pool, and amongst the three of us we used to win all of the team championships held in this pool. I was about thirteen years old at this time.

From there we migrated to the North Side Y.M.C.A. on Larrabee Street. We joined the 'Y' team, and swam here regularly during the winter months until I was about fourteen years

old. The only thing about the 'Y' was that we could go in only twice a week, and that wasn't enough for such fish as we were turning out to be.

In the summer time we would go to the Oak Street Beach, a long sweep of sand on Lake Michigan at the south end of Lincoln Park. We had a big gang here, but the only one I can recall offhand besides the Miller boys, is Fred 'Pal' Lauer, who has since become, in my opinion, the greatest goal tender in water polo the United States has produced. Lauer was a big, handsome youth with black, curly hair, a regular giant of a boy, and his size has been one of his greatest assets in guarding the polo nets. He is also a member of the I.A.C. team and made two trips to the Olympic Games with the American water polo teams.

While I was swimming around at Oak Street one summer day, a man by the name of Peters noticed me. He was assistant coach of swimming at the Hamilton Club. He saw that I had possibilities and urged me to call at the Hamilton Club Pool and try-out for the swimming team. This I did, and I swam at the Hamilton Club for several months. I got so I could do a

hundred yards in about fifty-eight seconds, and that was pretty good time for a boy who had never been through any discipline or instruction to speak of.

The coach at the Hamilton Club saw that I was making progress and he suggested that I join some of the bigger teams. He said he did not have much of a team at the Hamilton and the possibilities were limited as far as what the club could do to back me in big time competition.

At about this time I ran into 'Hooks' Miller again. He had made the team at the Illinois A.C., as he was able to do the hundred crawl in about fifty-six seconds, two or three seconds faster than I could make. He urged me to come over to the I.A.C. with him, and I did. He introduced me to Coach Bachrach. That was in October, 1920, and I was fifteen years old.

At that time I was tall, skinny, and awkward, weighed about one hundred and sixty pounds, and was about six feet two inches for height. I plunged in while Bachrach watched me, and I ploughed through the water with the terrible stroke I had in those days. I could make good

time because I was so long and skinny, shooting through the water like a stick.

When I got through, Bachrach handed me a card that made me a member of the I.A.C. team. He drew me to one side and said:

'Now you come down to-morrow and I will start you on a real course of training. You are going to get something that I have never given anybody before — these other boys will not be in your class at all. Now I'm going to change your stroke all over, and I want you to do everything I say to the letter, without question.'

So I agreed. At that time my stroke was all wrong. I crossed over with my arms in front: that is, I reached across what would be an extended line in front from my shoulder, reached across my head with each hand in turn. I held my arms straight and swept them wide; I didn't make a full stroke with the arms. My legs were used in a mongrel way, and I had no system about breathing, body position, or anything else.

Bachrach started me out working with the arms only, and for months and months he gave me no instruction whatever about the use of the

legs. All I did was to learn the arm stroke — and relaxation. If I thought about the legs at all and felt that I wanted to kick with them, he said I could do what I liked; but for the most part I forgot about them entirely and just trailed them behind me.

He taught me the secret of relaxation, how to get my rest within the stroke; that is, how to relax and still keep on swimming at good speed. There is a real trick to this, and it is hard to put on paper. It is one of those things that must be learned from long experience with using the right stroke and keeping in mind the technical points he gave me.

Now in these training days, using the arms only, Bachrach did not let me go out and plough away without thinking what I was doing. That is something he has always insisted upon, that I be thinking at all times. He would stop me every now and then and say:

'What are you thinking about?'

'Well,' I'd reply, 'I'm thinking about not crossing over with my hands out in front. I'm thinking about keeping my elbow bent; about not reaching too far out in front.'

'All right,' he'd say. 'Go ahead.'

Pretty soon he'd stop me again and say:

'What are you thinking about?'

'About how and when to bend my elbows,' I'd answer. 'About not holding my arms straight; about keeping my shoulders flat, not dipping down with either shoulder on the arm I am pulling with; about keeping the shoulder and elbow higher than the hand when I'm making the catch of the hand; about keeping my head up.'

'How about relaxing?' questioned Bachrach. 'Aren't you thinking about that?'

'Yes, I'm thinking about that, too,' I'd say, for that was one thing above all others that he'd never let me forget. Even to this day he nags me everlastingly about relaxation. And it's the greatest secret of my success — relaxing at the same time you are swimming at maximum speed.

How I eventually mastered relaxation may be gleaned from the following quotation from an article entitled 'Loose People,' printed in 'Collier's Weekly.' The author, Grantland Rice, was telling about the importance of loose-jointed-

ness in different kinds of athletic activity. Speaking of one of the world's championship races at the Olympic Games, Rice said:

'There were, among others, Arne Borg and Charlton, the great Swedish and Australian stars, keyed up and ready for the big test. They were all set and eager to get away. Suddenly another entry, who had been talking and laughing with a near-by group, threw aside his bathrobe and strolled into line. He still had a broad grin and his hands were also dangling at his sides as if hung there by strings. There was only a second or two before the starter's gun would bark. And yet this latest arrival was about as tense as a loose towel. Just before the gun cracked he turned and said, 'Come on, fellows, let's go!' And he hit the water with the loosest-looking body and the loosest-looking pair of arms one could ever expect to see. His name was Johnny Weissmuller. On that occasion he won another Olympic championship and broke another world's record as he outsped Borg and Charlton through the last few yards.

'Weissmuller knew the competition that he faced. He knew that he had to break another

world's record to win. And yet there wasn't a single sign of nerve strain or tautness or physical stiffness either in arms or body. He remained loose and willowy and elastic on his way through the air into the pool.'

Now there is a secret about the arm stroke that even some of the world's fastest swimmers of to-day have not mastered. This is that the arm stroke is a pull and a push. Get that — a pull and a push; not a thrash or a sweep or a chop or anything else. Bachrach showed me just how to get this 'pull and push.'

The pull part comes first. After making the catch of the hand in front, not reaching too far out in front, but reducing the reach by bending the elbow, and keeping the elbow and shoulder higher at all times than the hand, you pull almost straight down in the water on a line with the shoulder. When the hand comes under the shoulder and to the breast, the pull ceases and it becomes a push.

At this point the hand is about eight or ten inches separated from the breast, and the elbow is pointed out. From here you carry on the stroke, pushing backward and outward. The

push ends at the hip and then you relax your arm. You bend the elbow still more, and in recovery your upper arm is carried parallel to the water, the lower arm and hand flopping loosely at an angle of forty-five degrees. Here the lower arm, wrist, and hand are getting their relaxation. As the arm arrives to the forward position, it straightens somewhat, and here you get your relaxation in the upper arm and shoulder.

Always I am thinking about getting this relaxation, keeping easy and loose all over. I developed a great arm stroke during these months when I never used my legs and feet, but forgot about them as much as possible. Naturally they dragged along in the water rather deeply and made my position in the water somewhat different from what it is when I use the legs also.

Finally, Bachrach started me on the leg stroke. He told me to flutter the legs up and down in the style I have described fully in the earlier chapters of this book. At first he told me to count six beats of the legs with each revolution of the arms. That meant three leg beats on each arm as it was making its pull. I used to

count one-two-three, four-five-six, for hours at a time, daily, for months. Nowdays, of course, I never think about the leg beats, the number I make to each revolution of the arms; and the reason for this has been pointed out elsewhere.

Now getting the legs into play changed the position of my body. The legs drove me higher in the water, lifted my whole body up so that my chest was hydroplaning on the surface; my head was up high, and that part of my back between the shoulders, and almost to the waist, was clearly out of the water.

Lots of swimmers can get their heads up, but this throws their feet down so that they are swimming more at an angle than I do. My whole torso rides on the surface of the water, and only my hips and legs are submerged. This position is achieved by arching the back up and getting tremendous power with the leg drive.

Once you get up to this position, you ride with great ease, except for the fact that you've got to keep going fast to hold the position. If I swam slower, I'd use just as much effort in getting the reduced speed, because I'd be lower in the water, encountering more resistance.

These are the things that the coach drilled me in for months in those early days before he ever allowed me to go into any kind of race or even swim alone against the watch for time. Then came the days, alas, when I was given my first preliminary try-outs.

CHAPTER XV

EARLY APPEARANCES IN COMPETITION

In the January, 1921, issue of our club magazine, in the course of an account of the meet of Thursday evening, January 6, I was mentioned as 'the coming champion' for the first time. Previous to that time I was unheard of outside of the club. Some Central A.A.U. championships were being contested in the club's pool that night, and the account contained one paragraph which read as follows:

'Herbert Topp, of the C.A.A., defeated J. Weissmuller of the I.A.C. in the men's junior hundred yards championship in fifty-seven and two fifths seconds. Weissmuller is a schoolboy of seventeen, and he is new to open competition work. He made three false starts, jumping in the water each time, which, with his somewhat erratic swimming, showed his overanxiety.'

My name appeared for the second time in the April issue, being merely listed as having won the open hundred-yard free-style race at the National A.A.U. championships at the Great

Lakes Naval Training Station, March 17. I defeated Jam Handy, a team mate, and the time was one minute, one and one fifth seconds. With the story appeared a one-column picture of me, saying I was 'one of the most promising of our younger swimmers.' I was also mentioned as finishing second to Norman Ross, of the I.A.C., then the world's leading swimmer, in the national championship at five hundred yards free style.

Now this account may conflict with the claim made in my behalf by Bachrach that I have never been defeated in a free-style race. However, these were only preliminary try-outs, and he claims they should not count, for my real début was made at Duluth on August 6, in a meet at the Duluth Boat Club. There I won the National A.A.U. championship at fifty yards free style, and the Central title at one hundred yards free style. My time in the first event was twenty-three and one fifth seconds, within one fifth of a second of the world's record; and in the second event, fifty-five and one fifth seconds, which was very fast time in those days.

I may be said to have 'arrived' later the same

month. In the National A.A.U. outdoor championship races, held at the Edgewater Beach Hotel on the 27th and 28th of the month, I swam second on the four-hundred-yard relay team which, on the first day, won the title in three minutes, fifty-one seconds, a new world's record, and on the second day swam anchor on the team that won the Central title at four hundred yards a second slower.

With these two meets I had made my début in regular competition successfully, in Central and National championship events, and won some recognition in the Middle West. I had come near a world record, but had not yet broken one. Comments from the East indicated some skepticism of the stories they had heard about me. Experts in one section of the country are always a bit doubtful about the timing of performances announced in other sections, and in other countries.

It was only natural, therefore, that I went East in the latter part of September, anxious to make a good showing and convince the world that my first performances were not a false alarm. This anxiety, felt also by my team

mates, keyed me up to the point that I not only won every race I entered, but established my first world's record. This was at one hundred and fifty yards, done at Brighton Beach, N.Y. I swam in one minute, twenty-seven and two fifths seconds, taking two and one fifth seconds from the mark held by Ted Cann of New York.

During this, my first season outdoors, I also won the two-hundred-and-twenty-yard National championship at Indianapolis, Indiana, defeating Ludy Langer of the Hui Nalu, Hawaii, and my team mate, Ross, in the fast time of two minutes, twenty-eight seconds. I had won the fifty-yard National, and the Central hundred-yard free style, as well as swimming on National and Central championship four-hundred-yard relay teams.

These first performances of mine naturally remain more clearly in my memory than those that have come in the years between then and now, and that is why I am going into them in some detail.

My second free-style world's record was made indoors, in the I.A.C. Pool, which is of the

sixty-foot variety. An article in the 'Tri-Color' for December told about it as follows:

'On November 21, Johnny took it upon himself to make a mark in swimming history. The I.A.C. staged an open swimming meet for the benefit of a visiting delegation of A.A.U. officials from all over the country. These officials were here to pass on new records for the year, and also to award various athletic events to clubs bidding for them.

'Bachrach had a premonition that something was going to happen. He felt that certain records were threatened, so every precaution was taken to see that any records made would be authentic. The A.A.U. officials measured the tank to the fraction of an inch. The stopwatches used for timing — and there were plenty — were all previously tested for accuracy. All the possibilities for a fluke were eliminated.

'Johnny was nervous and made a false start, but when he actually started, good-night! He made the fastest time ever negotiated through water by a human being, covering one hundred yards in fifty-two and three fifths seconds.

Think of it — fifty-two and three fifths seconds for one hundred yards!

'After the race, spectators were more out of breath than Johnny was. Timers, judges, and watches all agreed that then and there a record was made that will remain a record for some time to come. It is safe to say that those who were so fortunate as to witness that marvelous exhibition of swimming will never forget the thrills it afforded them.'

CHAPTER XVI

DOWN — AND UP AGAIN

My championship career was not one of unalloyed bliss from start to finish. I had my ups and downs no less than everybody else. One of my 'downs,' which came early in the summer of 1923, was discussed in the following article in the club magazine:

'Either there is nothing wrong with Johnny Weissmuller and a false alarm has been sounded, or something strange, remarkable, and exceptional in the realm of athletics has happened. The issue remains for specialists to decide. In the mean time, Johnny is resting in the hospital.

'Following the races at Decatur, Illinois, on the Fourth of July, Johnny experienced a weakness, slight fever and fatigue, something he had never known before as the result of swimming. What is it and what caused it? That is the problem. His performance that day was not of unusual severity.

'While Johnny competed in five races, the

total distance he covered did not exceed two thirds of a mile. Many youngsters his age and less have been going in for a mile, two-mile, and five-mile battles. Johnny traveled at fast speed over the distances he raced, but it should be noted he had no real competition!

'Johnny's performance was a matter of form, of getting there fastest in the easiest and most graceful manner. None of the events called forth any muscular strain. None of them called for the excitement of a battle for victory.

'Bachrach has never allowed Weissmuller to swim long distances, whereas other young swimmers go after any stretch for which they take a notion. In a good many cases it is a matter of fight, not form, with them. Weissmuller's performances are a matter of form.

'It is an accepted practice in our club athletics to keep youths at the shorter tests until their hearts mature.

'Johnny has not been overworked. For six weeks following the close of the indoor season, he was kept out of the water entirely. Then for six weeks he was gradually worked into shape, advancing from shorter distances to longer. He

was taken to Lake Geneva for a week as a part of his outdoor preparatory work.

'Then he swam five hundred yards at Great Lakes on June 27, setting a new record of five minutes, fifty and two fifths seconds. After that he went to Newark, New Jersey, on June 30 to come within three fifths of a second of his own world's record at three hundred meters. The day after his return from the East, he went with the team to Decatur.

'After all, however, he did not swim a total of two thirds of a mile, and the performance was nothing extraordinary for him.

'He showed no signs of trouble as he left the scene of the contests. Bachrach took him in an automobile to the hotel, where he lounged around in the lobby. At dinner, half an hour later, he showed the first indications of trouble. Johnny is an unusually hearty eater, especially after a race, but he had no appetite at the table. Bachrach recognized that something must be wrong and advised him to go to bed. He wanted to wait, however, until the prizes were passed out. When he got his prizes, he went to bed.

'He came home with the rest of the team that

night, leaving Decatur at midnight and spending the rest of the night in a sleeping-car berth.

'On arriving at the club the following morning, a doctor was called. He advised that Johnny be taken to a hospital. It was thought that something was wrong with the action of his heart. Two days later, the doctor reported he thought Johnny had an acute dilatation of the heart, but that this was not certain, and that specialists would be called to determine more accurately what his trouble is.'

'It turned out that all Johnny had was a case of grippe. He couldn't rest, and the doctor gave him some "dope" to put him to sleep. It was eventually determined that the "dope" was an overdose, and it was this overdose, not the strain of racing or the grippe, that affected his heart.'

My recovery was as rapid as could be expected, and my return to competition was recorded in an account of the I.A.C. swimming team, helping to make a success of the dedication of the new outdoor swimming pool at DeKalb, Illinois, in August, when Robert Skelton set a new American record of three minutes,

eight and two fifths seconds in the two hundred and twenty-yard breast stroke.

'Second only in importance,' said the article, 'to the shattering of the world's record was the appearance of Johnny Weissmuller, world's champion swimmer and holder of forty-two records. It was Weissmuller's first public appearance since he was ordered by physicians to quit swimming because of an ailing heart, some six weeks ago. That his recovery has been complete was demonstrated by his performance in the hundred-yard free style event, the only event in which he competed. He won in fifty-five and four fifths seconds, which is only three seconds over his own world's record.'

After that, I gradually got back into competition and continually improved my old records. To tell about them all would be tiring, but it is interesting to note that I reached probably the peak of my career in 1927, as told in the following account in our club magazine:

'"Greater than swimming the English Channel!" declared Charles A Dean, national authority on athletics, commenting on the world's record of forty-nine and four fifths seconds for

one hundred yards swum in the sixty-foot pool of the Illinois Athletic Club Thursday night, January 6, 1927, by John Weissmuller, breaker of more world's records than any other performer in aquatic history. Dean, a former president of the Amateur Athletic Union of the United States, for a number of years chairman of its track and field committee, and manager of the last American team at the Olympic Games, has been an official of hundreds of athletic events in all parts of the United States.

"'"Weissmuller's performance," asserted Dean, "is the greatest I have ever witnessed in any line of athletics. It outclasses running one hundred yards in nine seconds, something that many experts declare will never be done. His feat of cutting one and two fifths seconds from his own world's record for the event lacks the dramatic features of battling wind, wave, and tide to catch the public fancy, which attaches to Channel swimming, but to those who know their aquatics it is a much more significant performance.

'"'It represents a triumph of perfection in technical skill, of mental preparation and de-

termination, of the scientific application of strength, energy, and power. Weissmuller's triumph is rightfully shared by his coach, William Bachrach, who thereby reached the peak of a long and brilliant career of producing record breakers.

'"Many swimmers have negotiated the English Channel. Only Weissmuller has paddled one hundred yards in forty-nine and four-fifths seconds, or anything near it. I never expect to see anybody break this record, except Weissmuller himself."

'For his greatest world's record, Weissmuller leaped to a fast start as R. E. Davis fired the gun. He hit the water cleanly and ploughed away straight as an arrow. Weissmuller appeared in his best stroke as he negotiated the five lengths of the tank. The crowd cheered him wildly on the last two lengths, giving encouragement that aided in making the record. It was Weissmuller's first record of the indoor season and his first important performance in more than six months. The occasion was an I.A.C. invitation swimming meet, in which high school, college, and club stars appeared.'

CHAPTER XVII

INVADING LONG-DISTANCE REALMS

Bachrach had always insisted that I was a sprint, not a long-distance swimmer. At any rate, my speed at the shorter distances assured me of victory, while the longer distances offered room for doubt. Bachrach insisted that in my youth I should keep to the sprints, because they were less of a strain on the growing body, leaving the longer grinds to older men.

However, in July of 1926, I went out for the three-mile Chicago River swim. I wanted to break the record, but owing to rough water I failed. The following year I tried again, and this time I was successful in establishing a new mark for the course. Bush wrote about these races as follows:

'Yielding to the pressure of public interest in long-distance paddling created by the triumph of Miss Gertrude Ederle, of New York, over the English Channel, John Weissmuller, world's greatest sprint speeder and holder of some fifty international records, splashed out into Lake

Michigan the other day and captured the eighteenth annual Chicago River Three-Mile Marathon Race.

'Something like that had to be done to preserve to the Coach William Bachrach squad the thousand-dollar trophy which it has practically monopolized from the earliest days. Bachrach had nobody else to send after it who was sure to win, though George Schroth, twice winner of the Golden Gate Marathon in San Francisco Bay, was considered a possibility. Arne Borg was in Europe.

'So Weissmuller, who never before competed at any distance more than a half mile, had to do it. As a result, he appears destined to capture more honors in this line.

'Johnny finished a quarter of a mile ahead of his nearest rival and nearly a mile ahead of the bulk of the field. His time of fifty-six minutes, forty-eight seconds, however, was twenty-eight seconds slower than the record, showing that the Tri-Color star has some tricks to learn about the long-distance game. However, it was eight minutes faster than the time made by Howell in winning last year's contest.

'Richard Howell, of the Chicago Athletic Association, who set the record four years ago and who won again last year, cannot compare with Weissmuller in short sprint swimming, but he has always been good at longer distances. Howell declined to enter Saturday's race, but was on hand to see the start and follow the race in an official motor-boat, and at the finish to shake hands with the winner.

'Conditions hampered Weissmuller. He had much rougher water than Howell when the latter made his record. An offshore breeze kicked up a choppy sea which slapped into the faces of the swimmers on the second mile of the jog. As they turned west into the ship channel leading from Lake Michigan into the Chicago River, this wind kept them back and the waves beating on their shoulders made their upper-arm work awkward and tiresome.

'Johnny took an early lead after the start from the shore of Lake Michigan on the north side of Municipal Pier. Using an average of thirty-one strokes a minute, he built up a lead of fifty yards over Solomon Adler, of the Covenant Club, who led the rest of the field by a similar margin.

Turning south around the pier, Weissmuller increased his lead to one hundred yards by the time he struck the channel. Here he turned west into the face of the choppy sea.

In adjusting to his chop, Weissmuller decreased his stroke to twenty-eight a minute. In this stretch his pilot interfered with him somewhat. Peter Weissmuller, brother of the champion, was rowing the boat and found it difficult to keep up with the swimmer against the wind and hold a straight course. He kept edging over toward the swimmer, and, instead of correcting the boat's course, kept requesting Weissmuller to bear off.

'When he entered the river, with the current running out of the lake and up the river, Weissmuller increased his stroke to thirty-one a minute and built up a three-hundred-yard lead on Adler before the latter struck the current. The champion's pilots almost wore him out nearing the finish, telling him, "Only one more bridge," so many times that he almost lost confidence in them and spent his sprint too early. The finish was at Wells Street, the fifth bridge.

'Johnny stated that for the three miles he did

not change his ordinary rhythm of six leg beats to one revolution of the arms, but he put much less energy into the leg stroke than he uses for sprinting. He was very much pleased with the victory and undoubtedly will be seen in other distance events from now on. He will try for the record again next year.

'Thousands of spectators saw the race from motor-boats, wharves, and bridges. Adler finished in sixty-two minutes, seventeen seconds, while George Schroth, of the I.A.C., was third in sixty-six minutes, fourteen seconds.

'Two Milwaukee swimmers, Royal Bethke and Leston Semmes, came in fourth and fifth, their time being sixty-six minutes, twenty-four seconds and sixty-eight minutes, eight seconds respectively. Of the thirty-one entries, twenty-six started. The first twenty received prizes. The first breast-stroke swimmer to finish was A. W. Gerlings, of Elgin, Illinois, who was thirteenth.

'One of the champion's pilots was S. C. Jenson, of the I.A.C., who won the first Chicago River Marathon eighteen years ago.'

In August of the following year, I broke the record as told herewith:

'Thousands banked upon barges, bridges, and the two levels of Wacker Drive yelled themselves hoarse, sirens shrieked, bells clanged, and horns tooted Saturday, July 30, as the long arms of Johnny Weissmuller, of the Illinois Athletic Club, flashed through murky, green water to a record-breaking finish in Chicago's greatest aquatic spectacle, the nineteenth annual Chicago River Three-Mile Marathon. From the start at the north side shore line of the Municipal Pier to the finish at Wells Street Bridge, Weissmuller, leading the way, was acclaimed by some fifty thousand spectators, the greatest crowd in the history of this swimming event.

'It was a performance worthy of the crowd which lined the sides and the ends of the pier, massed upon the breakwaters, and upon the docks. Wacker Drive offered seats to many more thousands on its two decks than ever before were able to get a good view of the finish of this sporting classic of Chicago waters. Hundreds followed the course of the race and the leadership of Weissmuller in excursion boats, undaunted by the shadow of the tragedy of the Favorite. For the benefit of these thousands,

Weissmuller trimmed nearly two minutes from the record for the course.

'To the honor and glory of the Illinois Athletic Club and his teammates, Johnny turned in a new record of fifty-four minutes, twenty-nine seconds. The old standard for the long course was fifty-six minutes, twenty seconds, made by Richard Howell in 1922 when he was a member of the I.A.C. crew managed by Coach William Bachrach. It was Weissmuller's second try at long-distance performances and his second successive victory in the event.

'Fourteen of the nineteen years this event has been held, the I.A.C. swimmers have brought home the cup. Perry McGillivray won it four times. W. L. Wallen won it three times, twice before joining the I.A.C. Norman Ross won it twice, and now Johnny has claimed it twice. Weissmuller brought to the club this year the thousand dollar William Hale Thompson trophy for the victory.

'The champion employed a leisurely modification of his famous crawl sprint stroke. He slowed down the leg beats and indulged in a more restful roll from side to side.

BREAKING THE RECORD IN MY SECOND TRY FOR THE CHICAGO RIVER SWIMMING CUP
I was piloted by Peter and Robert Halloran (in the small boat)

'Piloted by his brother, Peter Weissmuller, who rowed the escort boat, Weissmuller assumed the lead at once. He battled his way through a mass of driftwood brought in by steamers docking at the Municipal Pier. Here the water was roughened by a fresh breeze from the northeast that sent waves crashing against the pier and caused considerable backwash that bothered the swimmers not a little.

'When he rounded the northeast corner of the pier, three quarters of a mile on his way, Weissmuller built up a hundred yards' lead on Adler. The latter advanced fifty yards ahead of A. J. Thomsen, of the Milwaukee Athletic Club, and Cyril Nelson, of Griffith Natatorium, who were destined to swim the closest battle of the spectacle.

'At this point some confusion was caused to the followers of the race. A rowboat, with a "Number 2" stuck up in the bow, rounded the end of the pier shortly after Weissmuller's Number 1. The programme said that Number 2 was Robert Hallaran, of the I.A.C., and many eyes were strained to see Hallaran's arms thrashing in the water. However, those arms

were not to be found. Then the oarsman of the boat took down the number, and it caused much speculation. What had happened to Hallaran?

'Later in the race, Hallaran was discovered sitting in the stern of Johnny's pilot boat. Hallaran had a big white bandage around his left elbow. He had injured his arm earlier in the week when he and Johnny went out from Oak Street Beach to aid in the rescue of the unfortunates on the Favorite, which overturned only a few miles north of the start of the Marathon. Despite his injury, Hallaran had come to the starting line prepared to compete, but Coach Bachrach refused to let him swim. Had he gone into the water at the start, nevertheless, and had his elbow stood the test, the I.A.C. might also display the trophy for second place, as Hallaran has proved himself one of the speediest and gamest swimmers Chicago has produced in many years.

'After turning the northeast corner of the pier, Weissmuller swam south half a mile to the end of the Chicago River Breakwater which extends east into the lake almost as far as the Municipal Pier. When he turned west around

the end of this breakwater, Weissmuller had increased his lead by fifty yards more.

'Under the south lea of this breakwater, Johnny found smoother water, and he made splendid time westward toward the mouth of the river. As he approached the river mouth, he sprinted for about two hundred yards. Hitting the current which flows into the river from the lake, Weissmuller stretched his lead over Adler to three hundred yards, and the latter had no chance to make it up.

'Though very few, even among the contestants themselves, appreciate it, the race to the beginning of this favorable current is the real test of the Marathon. The contestant who reaches it first automatically stretches out his lead without extra effort, for while he is being carried downstream, his slower rivals are still fighting the more stable and rough lake waters. When the slower swimmers finally reach the current, they get no advantage from it as far as the leader is concerned, for he enjoys the same current.

'From this point on, the Weissmuller *entourage* was picked up by a boatload of Hawai-

ian ukelele players and singers, who added much to the gayety and color of the occasion by chanting:

'"Clap hands — here comes Johnny!"

'These Hawaiians were out there primarily to root for their countryman, John Kaaihu, of the Healani Boat Club, Honolulu, but this invader finished well back in the field, so they sang about Johnny while waiting for their comrade to paddle into view.

'At the mouth of the river, third position was seized by Dorsey Miller, of Hirch Center; Nelson took fourth position from Thomsen, but before the next-to-last bridge was reached, Thomsen again claimed fourth and held it to the finish by a body length.

'From every angle it was one of the greatest spectacles in the history of the event.'

CHAPTER XVIII

TWO TRIPS TO THE OLYMPIC GAMES

I MADE two trips to the Olympic Games as a member of the American swimming team, in 1924 at Paris and in 1928 at Amsterdam. Both times we returned with the team championships for men and also for women. They were great experiences which I shall always recall with pleasure, and I think it might be interesting to reproduce here accounts of the achievements of the American teams at these games. They are important as historical records, and should engage the attention of every swimming fan who likes to have some background of knowledge about his favorite sport.

An account of the swimming at the Olympic Games in Paris in 1924, appearing in the 'Tri-Color' for July, said that American swimmers, both men and women, showed great superiority over all their rivals.

'Chicago swimmers were well up to the fore,' it continued. 'Of the seventeen swimming events for both men and women, thirteen were

won by the United States, two by Australia, one by England, and one by France. Chicagoans won five of the eleven individual victories. Johnny Weissmuller was the outstanding star, winning two individual races and swimming on the championship eight-hundred-meter relay.

'A new Olympic record was set in every swimming event, which is setting a record for breaking records that will be hard to beat. Some of the marks, notably that made in the fifteen hundred meters, are remarkable. Andrew Charlton, of Australia, proved himself the greatest distance swimmer of all time by taking nearly two minutes from the world's best performance; while Weissmuller sustained his reputation as the world's greatest sprint swimmer.

'Of the eleven records set, America accounted for nine. An Australian and an English girl accounted for the other two. The men made a clean sweep of the first three places in three events, the one-hundred-meters free style, the springboard diving, and the fancy high diving. The girls cleaned house in the one-hundred-and four-hundred-meter free style events and the springboard diving.

LEADING THE AMERICAN FORCES AT THE OLYMPICS, AMSTERDAM, 1928

ANDREW CHARLTON, OF AUSTRALIA, AND ARNE BORG, OF SWEDEN, AT THE OLYMPICS OF 1928

'Japan proved a surprise, qualifying several swimmers and placing in two events, the one-hundred-meter and the fifteen-hundred-meter, free style. The Swedes, always so strong in diving, fell down badly. Instead of the clean sweep of former years, they placed only one man among the first three in three events. The Finns, so strong in track and field events, failed to score a point in swimming.

'The clean-up made by the girls was more complete than that of the boys. Out of a possible one hundred and twenty-four points, the girls scored one hundred and six. A perfect score for the men would have been one hundred and seventy-two, but they rolled up only one hundred and fourteen. The women scored nearly as many points in seven events as the men did in ten.

'In the men's events, Warren Kealoha successfully defended his back-stroke title, Duke Kahanamoku, twice Olympic winner in the hundred, was forced to take second to Weissmuller, and Clarence Pinkston, fancy high diving champion, placed third behind his schoolmates, White and Fall.

'Four Illinois Athletic Club swimmers won individual championships, two of them swam on the winning four-man relay team, and four played on the seven-man water polo squad.

'Winning the four-hundred-meter swim, Weissmuller proved his right to be called a champion, for he was forced every inch of the way by Arne Borg, of Sweden, and had to take several seconds from the record to win. Johnny's Olympic record time in this event was five minutes, four and one fifth seconds. In the hundred he recorded the time of fifty-nine seconds. The eight-hundred-meter relay team, on which he swam anchor, made the new record of nine minutes, fifty-three and two fifths seconds.

'Several surprising performances were put up by the other Chicagoans. Chief among these was the victory in the hundred-meter free style for women scored by Miss Ethel Lackie, of the I.A.C., the world's leading understudy of Weissmuller's style. She defeated Miss Mariechen Wehselau, of Hawaii, holder of the world's record, and others, in the new Olympic time of one minute, twelve and two fifth seconds.'

The following tells about the 1928 games in Amsterdam:

'Capturing five of the nine championships, the swimmers of the United States carried off high honors in the aquatic sports at the Olympic Games. Their triumph in a measure made up for our poor showing on the track the week before. Johnny Weissmuller, of the Illinois Athletic Club, performed as expected, defending the hundred-meter free style title in Olympic record-breaking time, and swimming on the championship eight-hundred-meter relay team.

'Our girls did even better, winning five of their seven championship contests. Miss Martha Norelius was the star of the women's team, breaking the world's record in the four-hundred-meter free style.

'Honors were piled up by the American swimmers to the tune of one hundred and seventy-five points, showing a wide margin over the rest of the field. Weissmuller capped the final day's events by winning the century dash. Pete Desjardines won both the high and low diving titles. George Kojac captured the hundred-meter back-stroke in record-breaking time.

The United States team, with Clapp, Laufer, Kojac, and Weissmuller, won the eight-hundred-meter relay. We placed eighth in water polo.

'Japan surprised the water world by winning the two-hundred-meter breast stroke with Tsuruta. Arne Borg claimed the fifteen-hundred-meter free style for Sweden. Alberto Zorilla, the New-Yorker, competing for Argentina, won the four-hundred-meter free style, and Germany captured the water polo championship.

'Among the ladies, in addition to Miss Norelius in the four-hundred-meter free style, the winners were Mrs. Betty Pinkston in high diving, Miss Helen Meany in low diving, Miss Albina Osipowich in the hundred-meter free style, and our relay team, composed of Lambert, Osipowich, Geratti, and Norelius, won the four-hundred-meter race. Holland claimed the hundred-meter back-stroke with Miss Marie Braun, and Germany the two-hundred-meter breast-stroke with Fraulein Schrader.

Weissmuller did what was expected of him in winning the hundred-meter free-style swim final and in equaling the new Olympic record in

fifty-eight and three fifths seconds, which he set in the semi-finals.

'The redoubtable Johnny Weissmuller was certainly one man who did not let the Americans down, but he did not have an easy job of it. Takaishi, the bearded Jap, was only third, but a new menace pressed Johnny in the last lap, Barany, of Hungary. Weissmuller went out and just beat him to the cement by one and a fifth seconds.

'The race was swum in a glistening pool under a sun-scorched sky. In the deep shadows at the far end of the tank, Takaishi seemed to beat Weissmuller to the cement at the last turn, but after a submerged turn, Johnny's long brown arms appeared flashing in the sunshine, leading Takaishi by a body's length, with the Hungarian cutting the water at their heels.

'The last twenty meters brought Barany away from the fishlike Takaishi, the Hungarian leaving a wake behind like a motor-boat. Barany's spurt broke up at about the same instant Weissmuller tapped the finish.

'In the semi-finals, Weissmuller ate up his favorite distance with huge, space-devouring

strokes in fifty-eight and three fifths seconds. With him qualified Kojac, who won both his preliminary and semi-final heats easily, and Walter Laufer, of Chicago, victor in the morning event, but a good second to the Japanese, Takaishi, in his semi-final. Laufer swam faster trailing the Far Easterner than Kojac did in winning his event.

'Alberto Zorilla of Argentina, emerged triumphant in the four-hundred-meter swim, considered the blue-ribbon event of the Olympic water sports, because it demands of the victor both speed and endurance.

'The graceful South-American speedster, who lives in the United States and perfected his technique as a New York A.C. swimmer, succeeded as champion Johnny Weissmuller, who defaulted his title in order to play water polo.

'Zorilla had to beat out, in addition to the three Americans, Arne Borg, the "Swedish hurricane" and favorite, and Andrew Charlton, the Australian strong boy, to win his brilliant victory.

'The South American appeared to be the

most surprised person in the swimming stadium after he had won.

'"I had expected to break the Olympic record," he said, "but somehow I felt both Borg and Charlton and perhaps Crabbe would also make it look bad.

'"Honestly, my fondest hopes were to finish within the first three."

'Borg, who set the pace until the last fifty meters, when Zorilla and Charlton swept past him, was the picture of dejection, but he soon rallied from the shock of defeat and before long was chatting with Martha Norelius and coaching her in preparation for the girls' relay race, which followed.

'Clarence Crabbe, of Honolulu, Austin Clapp, of Hollywood, California, and Ray Ruddy, of New York, the three Yankee standard-bearers in the four-hundred-meter classic, trailed in fourth, fifth and last places, respectively.

'America made a clean sweep of the hundred-meter back-stroke final in the Olympic swimming championships when Kojac, Laufer, and Paul Wyatt, of Uniontown, Pennsylvania, reached the finish line in that order.

'Kojac, swimming the race of his life, was timed in the new world's record figures of one minute, eight and one fifth seconds. Laufer was clocked in one minute, ten seconds, and Wyatt in one minute, twelve seconds.

'Thus, both Kojac and Laufer bettered the listed record of one minute, eleven and two fifths seconds and Wyatt missed it only by three fifths of a second. The former Olympic record for the event, one minute, thirteen and two fifths seconds, was made by Warren Kealoha, the Hawaiian, at the Paris Olympics in 1924.

'Kojac won the first semi-final in the hundred-meter back-stroke in one minute, ten seconds. This time was inside of the former record of one minute, ten and one fifth seconds, held by James A. House, Jr., of the United States, which Kojac broke Thursday, when he covered the distance in one minute, nine and four fifths seconds. Iriye, of Japan, was second and Beresford, of England, third, qualifying with Kojac for the finals.

'The second heat was won by Laufer in one minute, twelve and three fifths seconds. Wyatt was second, and the other qualifier was Kuppers,

of Germany, who came in third. Wyatt just managed to win by a "fingertip" from Kuppers, both being timed at one minute, fourteen and one fifth seconds.

'The two-hundred-meter breast-stroke championship was won by Tsuruta, of Japan, in two minutes, forty-eight and four fifths seconds. Eric Rademacher, of Germany, was second, and Ildefonso of the Philippines, third. Tsuruta failed by only four fifths seconds to equal the world's record made by Rademacher, but he established a new Olympic record by clipping eight seconds from the mark the I.A.C. swimmer, R. D. Skelton, made in Paris in 1924. Rademacher, with two minutes, fifty and three fifths seconds, and Ildefonso, with two minutes, fifty-six and three fifths seconds, were also inside Skelton's Olympic mark of two minutes, fifty-six and three fifths seconds. The winner swam with an easy motion, in strong contrast to Rademacher, who splashed right and left and used up a great deal of energy.

'America won the men's high-diving title, when, on a recount, Desjardines, of Miami Beach, was awarded first over Simaika.

'The high diving, usually a tedious event to watch, was enlivened by the superb performance of Michael Galitzen, known familiarly as "Micky Reilly," which never failed to evoke an outburst of cheers. He hit the water from the ten-meter platform as clean as a driven spear, but Desjardines seemed so perfect that the crowd was baffled in trying to choose between them.

'Simaika, the Egyptian, living in Los Angeles, was possibly the most sensational of all the divers, his two and a half forward somersault making the crowd gasp. How the divers are able to time their revolutions through thirty-five feet of air puzzled everybody.

'Simaika's prematurely announced victory sent the Egyptian flag up the mast amid great enthusiasm, but on a recount at the end of the day it was contradicted, Desjardines getting first, Simaika, second, and Galitzen, despite his popularity with the crowd, third.

'Desjardines gained a magnificent victory for America in the springboard diving. Galitzen was second, and Simaika was third, with Harold Smith, of Los Angeles, fourth.

'From the very first dives the Americans took the lead in the field of nine competitors.

'Desjardines and Galitzen would have been crowned Olympic champions in low springboard diving after three dives had been completed if popular enthusiasm of the spectators governed the competition. Each turn of the American stars on the springboard was greeted with prolonged applause while they steadily piled up points.

'When Desjardines obtained the maximum number of points from the judges in the double somersault forward running, the stands shook with such a roar that Desjardines must have heard the noise before his head emerged from the water.'

CHAPTER XIX

ANNOUNCING MY AMATEUR RETIREMENT

My retirement from amateur competition was announced in the newspapers on December 26, 1928, the day after Christmas, and by an article by Clarence A. Bush in the December number of the 'Tri-Color Magazine.' This article also contained an account of the 'farewell' dinner given me by the club, and it read as follows:

John Weissmuller, of the Illinois Athletic Club, the "Prince of Waves," is planning to abdicate his amateur crown. The "human hydroplane," who has dominated sprint swimming for eight years, will make his last appearance in amateur competition at the I.A.C., January 3, in connection with the twenty-second annual Cook County Interscholastic Swimming Championship meet.

'Johnny finds it necessary, approaching his twenty-fifth birthday, to devote more time to earning a living. To remain an amateur cham-

HOW THE JAPANESE TURN OUT FOR SWIMMING MEETS IN TOKYO
Weissmuller in the center with the Stars and Stripes

pion, keeping in constant training and making frequent extended trips to distant cities, would delay his business career.

'After dominating the amateur aquatic world for eight years or more, Weissmuller retires undefeated. With few exceptions, he holds all free-style world's records in pools of all sizes at distances from fifty yards to eight hundred and eighty yards, indoors and outdoors. Coach Bachrach says he could probably go on indefinitely breaking records and winning titles.

'In a letter to W. G. Uffendell, chairman of the athletic committee, Weissmuller said:

'"I am planning to give up my career of swimming competition. My last appearance as a competing amateur will be in the Illinois Athletic Club swimming meet January 3.

'"I am getting to an age where I must look to the future and try to earn some money, something an athlete in constant training finds hard to do, and so it is with a great deal of regret that I must take this step.

'"I wish to take this opportunity to thank the athletic committee and all the members of the I.A.C. and Coach Bachrach for the wonder-

ful encouragement they have given me since I joined the club's swimming team in 1920.

'"I joined the club as a poor boy, unknown, and through the support of the members of the I.A.C. and my coach, Mr. Bachrach, I have had a glorious time, a chance to see the world, and get a real education. No athlete could ask for any better treatment than that accorded me by the Illinois Athletic Club.

'"The club has given me the opportunity to meet many representative business men of Chicago and I have made many friends in the club whose friendship I prize very highly.

'"While I will not be competing for the I.A.C. in the future, I will still be a member and interested in anything the club does, especially in its athletic teams. I will be pulling for the I.A.C. teams with all my heart, and hope to continue my many friendships among the club members.

'"Again I wish to say that I regret it is necessary for me to take this step, but I am sure that Coach Bachrach will find and develop another champion as he always has in the past."

'Weissmuller, according to Coach Bachrach,

brought to a new perfection of style the American crawl stroke. He became the stylist of champions, getting more speed than any rival with a comparable amount of effort. His stroke reduced water resistance to a minimum, facilitated breathing, put the body in a position to make unimpeded use of all its strength and leverage, and got the most propulsion for the effort expended.

'When Johnny was given his first try-out in the I.A.C. Pool in October, 1920, Bachrach handed him an athletic membership card immediately without awaiting the sanction of the athletic committee. He kept him under cover until the following August, when in his first meet Weissmuller won his race and broke a world's record.

'Coach Bachrach has always relied on Johnny to pull the team through close competition. He never lost a free-style race, and Bachrach says he is the only swimmer in the world with such a record. Perhaps his greatest performance as an amateur was one hundred yards in a sixty-foot pool in forty-nine and four fifths seconds. This compares to running the hundred-yard

dash in nine seconds, something that has never been done.

'Weissmuller represented the United States at two Olympic Games, and an Olympic record fell each time he appeared. In Paris in 1924 he won two individual events and swam with the winning relay team. These were the only races he entered, but he played water polo.

'One of his outstanding performances, in Coach Bachrach's view, was at the National A.A.U. championships in Honolulu. "Our team," said the coach, "had to have a first in the eight-hundred-and-eighty-yard swim in order to win the meet. That is outside of Johnny's regular line and he had done no training for the distance. No team mate had a chance to win it, and though he had already been through his regular strenuous racing programme, Johnny plunged in and won the half-mile title in world's record time."

'If he applies the same intense interest and fighting spirit to business that he did to dominating the swimming world for eight years, Johnny Weissmuller should make a notable success in whatever field he enters. This was

the opinion expressed by one speaker after another at the dinner to the world's fastest sprint swimmer at the I.A.C. in connection with his announced retirement from amateur competition.

'More than fifty of the faithful gathered in his honor. C. F. Biggert, president of the club, called Johnny the greatest "champion of champions" the club has ever had. He thanked Weissmuller and his coach, William Bachrach, for the honor and glory they earned for the club, spreading its fame around the world. President Biggert's speech, eloquent with sincerity, struck the keynote of the dinner.

'George T. Donoghue, new chairman of the athletic committee, declared he felt he was inheriting a deficit, having a "whole team" like Johnny walk out at once. However, he complimented Weissmuller and his advisers on their wisdom in taking the step at this time, giving him the chance while still young to begin carving out a career in business for himself.

'Frank W. Blankley, chairman of the bath committee, summarized our star's achievements. Blankley stated he had won thirty-nine

National championships, three Olympic championships, and has fifty individual championship medals of major importance, not to mention the contributions he made to many relay and water polo championships. He broke fifty to seventy-five world's records. Mr. Blankley read a resolution from the board of directors, appreciating Johnny's service to the club and wishing him the best of good fortune.

W. Gibbons Uffendell, retiring chairman of the athletic committee, said he wished he could trade places with Weissmuller. He told how Johnny came to the club eight years ago, a gangling, unsophisticated youth, and pointed out that to-day he displays physical development comparable to that of the gods of mythology, and a charm of personality that wins him a host of friends wherever he goes. On behalf of the athletic committee, Mr. Uffendell presented Johnny with a handsome engraved gold watch.

'John Banghart, president of the Otters, eulogized Weissmuller in glowing terms, told about his unmatched competitive ability. For the Otters Mr. Banghart made Johnny a sub-

stantial present inscribed upon a slip of paper that will make him welcome at any bank teller's window.

'Andrew McNally told about how Johnny, in spite of the avalanche of flattery that has descended upon him, has remained modest, an unspoiled, lovable boy. Many have had their heads turned by an infinitesimal fraction of the adulation that has poured upon him, but Johnny, from his first day to the last, has never "high-hatted" anybody, said McNally. He has always conducted himself as a gentleman, always been a good fellow in the highest meaning of that term. He complimented Weissmuller upon his discipline, his strict obedience, even to the most casually expressed advice of his coach.'

In my response I found myself almost speechless, but managed to thank the club for all it had done for me, the friends it made for me, and I asserted that as long as I live there is nothing that I would not do for the club and its members. And that goes.

It has been more than a year now since I retired as an amateur, but I can't keep away from

the water. Of course, there is no professional swimming competition, and I have not tied up with any coaching job yet. I've been in Florida, Bermuda, and New York, swimming as much as ever for recreation — because I couldn't feel right without a daily work-out in the water. I haven't decided yet what career I shall follow, but I have a hunch it will be that of an airplane pilot on the big transport lines. I've had an offer of a scholarship in a flying school, and I think I'll accept, if I don't make good in the movies. I acted in one acceptably in the East, and was working in a talkie, with a lead part; but the picture was abandoned with the sudden passing of the star, Jeanne Eagles. My director has encouraged me to go to Hollywood and try to break in there.

Anyhow, I've certainly had a great time swimming, and if I had my boyhood days to live over again, I can't imagine anything more interesting to do than just what I've done.

THE END

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